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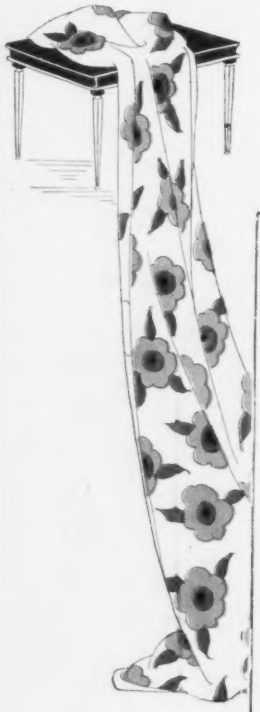

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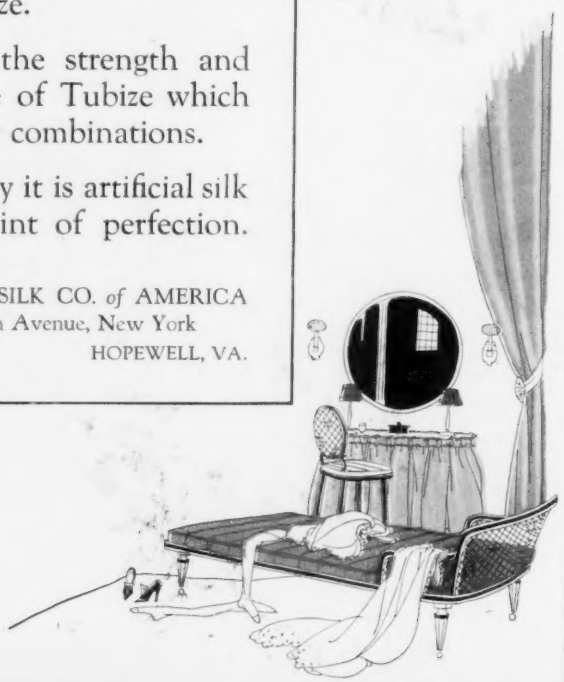

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MATHIESON Chemicals

A Remedy For One Dye House Trouble

ONE of the many possible sources of trouble in the dye house is the use of improper alkalies—special alkali mixtures which are seldom uniform in strength and often of unknown or uncertain composition.

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Our technical staff will be glad to demonstrate these facts at any time to interested textile men.

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With the Publishers—

Why You Never Get Some New Ideas

COTTON isn't publishing everything about development in the textile field that would be of value to mill superintendents.

This confession is made more cheerfully because papers in other fields are not giving 100 per cent service either. All have the same reason—some material cannot be secured. Why it cannot be secured is best told in the words of Leon I. Thomas, used one time before the meeting of a western efficiency society.

He had been talking about "getting the extra edge" on technical papers by contributions from readers.

"Influence upon readers grows when other readers tell in a technical journal of their common problems and solutions.

"An editor meets difficulties when he tries to get this sort of material for his paper. Brushing aside the 'haven't-the-time-to-put-into-it' excuse, the main reason for refusing to allow magazine use of a management plan may surprise and interest you. It is this, 'We don't feel that this plan has been in practice long enough yet to get all the faults out of it. We shall be glad to let you tell the story when we get the thing to working perfectly.' As you know, that time never comes. If the management is alive it can always find ways to better every plan it has.

"I lay no claim to having discovered this tendency to hold a thing back until it is perfected. I am merely echoing what has been said by others not in any way connected with technical journalism, but I do know from experience the retarding influence that this is on the development of the best in management.

"As one high executive in a Cleveland concern put it, 'And the best things are never absolutely perfected.' So, by this reasoning, much is lost to all."

COTTON has always urged the value of filing all issues of this paper, as well as any other valuable publication. Therefore, it is naturally pleased that a friend of the paper should have filed this efficiency society's report for several years, and in looking for other material, come across this expression of Mr. Thomas. There are several other interesting things, said by Mr. Thomas:

"Such magazines can bring to an executive the experience of others, whereas he would not take the time to visit other plants, even if he knew where to find the ones with the same problem he is facing."

"The technical journal has an entree to the manager when he has slippers on in the evening at home. There, no Browns or Jones interrupt him with troublesome details about this shipment or that material shortage. His mind is detached enough from office surroundings to see, undistorted, the value of an idea in its relation to the other factors in the case."

"Being a reader of such a magazine has a parallel in attending a convention, so far as beneficial results go. It differs in that it is 'held' once a month. Everybody can hear. There are no railroad fares, no smoky conference rooms (unless you prefer them to be) and no set hour for the meetings. But to get the best influence from either, don't merely register —enter your subscription—and then think your duty is done."

COTTON hopes to have every "delegate" at every monthly "convention," not only to give attention to the subjects discussed, but to see the interesting and helpful exhibits of supplies and equipment displayed by our advertisers.

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Marshall Dilling

Superintendent, A. M. Smyre Mfg. Company,

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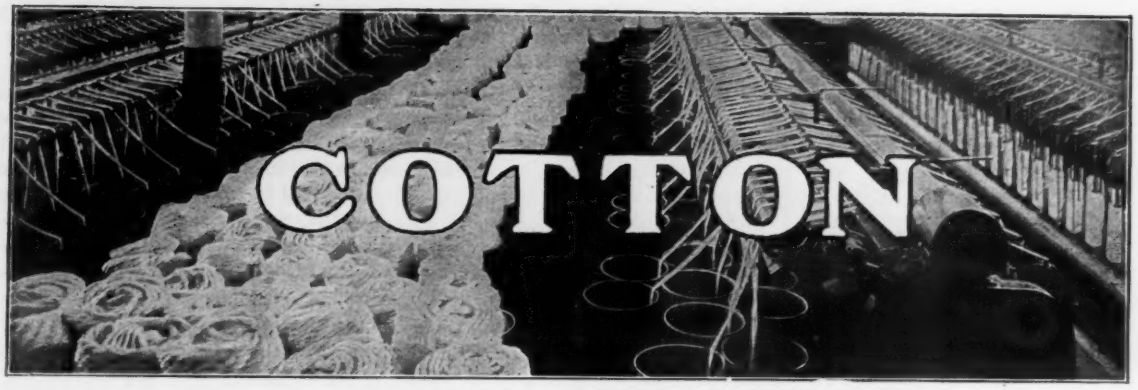


March, Nineteen-Twenty-Five

"The Last Refuge of the Oppressed."

Like the Washington monument, the noblest expression of American sentiment, the United States Supreme Court, also in its realm the most distinctive expression of this country, is usually taken for granted. To write of either, except for an audience of technicians, stone-masons in the one case and lawyers in the other, seems, off hand, to be a waste of time. Both of them appear to be so obvious that persons who write "popularly" of things national usually pass them by. Yet there is probably no American whose emotions are not stirred by even a picture of the magnificent obelisk that, dominating the field of monuments at the national capital, pays a nation's eternal tribute to the greatest of its founders.

There is probably as popular and deep-seated a pride in the United States Supreme Court, which sits almost under the shadow of "the monument." For it is as typically, even monumentally, American as the great, silent shaft of stone.

With national politics in that state of partial adjournment which comes usually with off-years, with most of the important economic problems of the country solving themselves pretty well in despite of politics, it is a good time for persons interested in public affairs to turn some of their thoughts to popularly neglected institutions like the great court.

Of all our national institutions, the Supreme Court of the United States is probably the most truly "popular," the most soundly democratic. There is nothing else exactly like it in all the world. And it is the product of evolution, the fruiting of a need, more than a consciously contrived mechanism. It is an illustration of how in the run of time moral force survives and wins and rules.

Thoughts like these are pertinent just now for several reasons. One has to think back only briefly to recall how the country was swept with seeming "rage" over the court's duplicated action holding that Congress had no right to interfere with the States in the matter of childhood. How that "rage" was artificially produced and was highly unrepresentative of the sentiment of the country is now illustrated by the almost unanimous action of the States in holding, en re the so-called child labor amendment to the Constitution, with the court and not with Congress. That amendment was submitted largely as a protest against the court's exercise of its "veto" power on behalf of the fundamental law of the land, and thereby on behalf of parents and children and local communities and the States.

One need think back even less briefly in recalling how, only last year, the Supreme Court weathered a political storm stirred up during a national campaign, when one of the contesting groups pitched its propaganda largely on a demand that the court's powers be curbed and Congressional powers be enlarged. Public opinion, as expressed through the two leading political parties, was all but unanimously with the court. This was so in despite of the fact that the court put forth no defense of itself and took no part in the controversy. In fact there virtually was no way for it to do either, which illustrates one of the singular aspects of that body.

This is its all but impersonal character, in a land and a time when nearly everything is rated in the degree that it is personalized. Who, except law students and "big" lawyers can name, off hand, the nine members of the court? To whom is the name Joseph McKenna, that of a man who recently retired from the court after a quarter of a century's service thereon, more than a name? Who gets excited about who is or is not put on the court, which has come to have in its keeping, the very ark of the national covenant?

Yet there is nothing that the American public so trusts as it does the Supreme Court of the country. This isn't because the court never errs, for no doubt it does. It is because, first, the public has to put ultimate trust somewhere, and, second, there has grown up with the court a tradition that with it virtually alone, of instruments of justice and freedom, there shall be no erring on account of expediency, or ambition, or yielding to popular or unpopular demand. Thus it has become the supreme protector of fundamental right and, in the true sense, the last refuge of the oppressed.

It is interesting to note the curious fact that, in the beginning, nothing like this concept was envisaged in the creating of the court. It was the product largely of an afterthought on the part of the makers of the Constitution. The court was not looked upon as of first importance by the first founders of the Government or by those who first sat on its bench.

It is interesting to note, too, that its rise, as well as the sustaining of its position, owes entirely to moral force.

Even today the court has scarcely a single instrument of its own for physical enforcement of its decrees.

No other tribunal in the world has such vast powers. Yet the exercise of those powers by apparently a handful of individuals cut off like dwellers in monasteries from the purview of the throng has been harmonized with the highest demands of true democratic government.

It is unfortunate that the windows giving an intimate view of the Supreme Court of the United States have been open mainly to followers of the law only. Lawyers are prone to extol the mysteries of their calling, and in doing so they often cause the public to develop exaggerated notions concerning institutions through which the law functions. This is illustrated by the feeling of awe and uncomprehension that the average person entertains regarding the Supreme Court. Yet of all branches of the national Government it is probably the least awesome and in its important aspects the most easily understood.

If the respect for and confidence which the public unquestionably has in the court were added to by a more intimate understanding of its character, there would be fewer of even attempted insurrections against it as an institution.

Harland Fiske Stone.

The name above was hardly known outside of academic legal circles when it became prominent throughout the country in the late Spring of 1923 on account of its possessor being appointed Attorney General of the United States. Lately it was given added prominence by the fact that it now is inscribed on the roster of the United States Supreme Court.

Mr. Stone's prime identity before being selected by President Coolidge to take over and "straighten-out" the United States Department of Justice was as an acadamic adherent of the law. During most of his professional career he was a professor in and for 13 years dean of the law school of Columbia University. He pursued the law academically for many years despite the vastly higher earnings which active practice would have brought to him. He was just giving up his academic connections and was taking up a practice which is said to have assured him at least $100,000 a year when he was made a member of the cabinet.

He took over the Department of Justice at, for it, a critical time. For a half dozen years it had been under fire on account of abuses that developed during the war and were continued with little excuse thereafter. He was doing an excellent job towards straightening out this highly important branch of the Government—a branch that had become oppressively autocratic and perniciously meddlesome, if not, in several ways, corrupt.

Whether it was solely because of his good work, or in part, at least, because that work forced him into conflict with many powerful politicians, that he was promoted to the Supreme Court is a question not easly answered.

However, the country was fortunate in having him for the brief period of nine months at the head of the Department of Justice. For, while therein, he set up precedents and rules that no successor is likely to ignore. The basic tenet of his policy as the head of the chief law enforcement branch of the Federal Government—a department that has become of formidable size and power—was that in enforcing the laws the laws themselves must in every case be obeyed. For the theory that the law enforcement official is above the law he had no patience.

He should be an excellent addition to the Supreme Court, on which sit men of wide "practical" experience, men who were taken from other courts or were outstanding as active practioners. A man with an academic background, one who is devoted to the study of the principles of the law and, therefore, to their application, should give to the highest court of the land, something that the more practically experienced do not always supply in its best form.

Letting the Tax Goose Live.

Studies made recently of Federal income tax returns for the year 1922 produce strong evidence supporting the conclusion, which should be obvious, that you can't kill the tax-laying goose and expect from it the golden eggs of revenue.

For that year the high surtaxes on big personal incomes were reduced from a maximum of 65 to 50 per cent.

One result was a large increase in the number of persons reporting large incomes. The number reporting incomes of $300,000 or more jumped from 246 in 1921 to 537 in 1922. The number reporting such incomes for the last year was much smaller than reported for 1916, the last prewar year when only moderate income tax rates prevailed. So it is evident that high taxes still were keeping a vast amount of property out of taxable channels even in 1922.

That the moderate lowering of the regular surtaxes did not bring all of the "new" big incomes back into taxable channels is shown by additional analyses of the 1922 returns. For the first time, the maximum tax collectable from income derived from the sale of capital assets that had been held for more than two years was limited in all cases to 12½ per cent. This relatively low rate accounted for a vast amount of income reported by wealthy persons. It was found, for example, that 17 of the persons who reported incomes of $1,000,000 or more derived 95 per cent of all reported income from the sale of such property. That many of them sold property, whose returns were taxable at the highest rates, rather than pay more than half of their earnings from it to the Federal Government seems likely. What they did with the funds thus derived is not made clear, but it is probable that in great part they were reinvested in tax-free securities. Anyway. the low rate on such income caused many business transactions that otherwise would have gone by the board to take place. It caused much capital that otherwise would be "frozen" on account of taxes to undergo at least one overturn.

The average rate of tax yield from incomes of $1,000,000 or more was only 35.02 per cent in 1922, against 63.59 per cent in 1921. Yet from incomes of that size the Government collected a total of $49,517,639 in 1922, against only $31,419,726 in 1921. Similar relationships are shown for other classes of big incomes.

One can find in the results of this study, as in former ones, much evidence showing that the Federal income tax as a "redistributor" of wealth is a dangerous delusion. As a rule, the States which apparently are hit heaviest by these taxes constantly show the biggest gains in reported income and in the number of persons making reports.

Bon Voyage, Mr. Coolidge.

Whether they are of his party or always agree with him, virtually all Americans like the man who began on March 4 his first Presidential term by grace of votes cast by a huge majority of those that voted. A witty woman once remarked of another New Englander, the rebellious Thoreau: "I love Henry but for the life of me I can not like him." To like one is more often a true tribute than to love one. While Coolidge is too much like the stern landscape of his native Vermont for any wild, emotional affection to be attracted by him, he is, nevertheless, like the typical Yankee (both in its sectional and general sense) that he is, likable in the extreme. To say he is more likable afar off than at close hand only raises the power of the attraction in relation to him as President.

Several writers lately have been contending that our truly great Presidents were not those so rated in the school books but comparatively unknown and disparaged ones like Hayes and Arthur and Benjamin Harrison. In this they follow in part some of the serious historians, such as Ford, who give high rating to several of the Presidents that commonly are regarded as having been second-raters. Several of them perhaps were great in that they brought about nothing which could mirror even a fallacious greatness. The best policeman is not the one who makes the greatest number of arrests but the one who preserves such good order on his beat that there is no occasion for making any arrests. And so it is measurably with all in public offices. The sublimest greatness is that which can forego, on behalf of right, a reputation for greatness. One of the worst temptations of public place is the ease with which situations can be brought about for merely glorifying those who bring them about. Many of the wars of the past were brought on in great part for that purpose by persons who now are rated great on account only of those wars.

President Coolidge, whatever his lack of genius, is not that type of ruler. One of the well-founded criticisms of him is that he hesitates to "start anything" or to deal vigorously with anything started by others until he has to. This seeming timidity can be a virtue. The times call for passivity, for the undoing of much that was done in the past, for holding out firmly against political innovations and expansions. And for this, Coolidge so far has been the ideal man.

To compare him with Washington, Lincoln, Roosevelt, or Wilson provokes only a smile. But it isn't one of doubt as to whether he measures up to the situation confronting him or will measure up to what may confront him during the next four years. In meeting this he may be as truly great as any of the Presidents of the past, and yet be passed by that epithet.

Anyway, the country believes in his honesty, his courage and his sound commonsense—and that's enough.

Scientific Calculation of Overhead Costs

BY HIBBARD S. BUSBY.

Introduction.

Southern builders of new mills can profit by consideration and engineering incorporation into their plans of certain methods of calculating many of the so-called fixed items of overhead. The writer has encountered, with considerable surprise, what purport to be authoritative statements and practices of methods of handling these items which are so completely at variance with proper procedure as to react very seriously in creating large errors in the final calculations. As the calculation of overhead reacts so directly and vitally upon total manufacturing cost the effects of any system of errors upon calculations of proper sales prices is apparent.

This discussion should have two points of interest to the mill organization:

1. To the financial executive of a business, serving as a warning against errors in cost estimates, affecting as these do the ability to compete in close markets.

2. To the head of the cost department, advising him as to details of methods whereby he can correct existing practices to a sound engineering basis and simplify the handling of his data through employment of correct methods of control and application.

The purpose of the work is to correct certain very serious basic engineering errors in the proration of plant overhead costs in such items as:

Rent	Interest and depreciation
Power	Supervision
Light	Indirect (unproductive) labor
Heat	

Bases of the Proper Method of Making Calculations.

Rent. Taking up these various items separately, we notice that the great majority of cost systems seem to consist of agreed upon methods of figuring and charging the several items, yet the methods agreed upon for distributing the bill against a department are at variance with the actual energy and asset values of the item. For instance: Rent, we are told, should be apportioned according to floor space. That may be the true proportion of value of the space, in certain up-to-date buildings, all on one floor level. (Everyone knows that it costs more to serve an upper than a lower floor.) Moreover, in most mills I have seen, it can not be said that all rooms are equally advantageous—certainly not for each and every process. It is obvious, then, that preferred space should get preferred prices—just as a corner lot is worth more to a retail business than is an alley location. If a certain process, like a particular type of business, demands certain housing and situation it should pay for the privileges and facilities thereof.

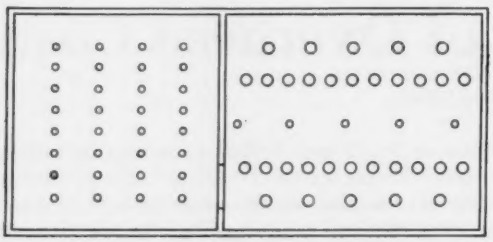
In assigning the fixed scale of values for the various locations in the plant, on this basis, the factors which enter into the determination of proportional cost to the whole rental charge of the plant, in the order of their importance, are as follows:

1. Cost of construction.
2. Cost of equipment.
3. Accessibility (not necessitating cartage, elevators or spur track) to the materials and stages of connected process.
4. Serviceability without use of artificial light.

It will be seen that the third item, and to a certain extent the fourth, may vary according to the process demands, and for this reason it will be advisable, not only in planning a new building but in the maintenance of an old plant, for the engineer to prepare and keep a comparative schedule of the various processes of the plant, together with the rooms which are or might be adapted to them, along with costs of changeover. Thus the figures for overhead change—and in some cases the possibilities of overhead reduction—are constantly available to any rental opportunity that arises.

Interest and depreciation charges of plant are treated in combination with this figure for rent, as the basis is so nearly the same, except that the costlier constructed department (in matters of building) is likely to be due for a longer span of life and therefore has lower depreciation per year.

Lighting. Within the total factor in which lighting cost affects other costs, as shown above, direct lighting of a process should, preferably, be charged through departmentally metered service. Consider the thing, moreover, from the electrical engineer's point of view: It may not be convenient nor economical to meter small departments, yet it is desirable to know the expenditure of electric current for lighting in each. Whereas, to a certain extent, number and capacity of lamps, together with resistance of the system to delivery of current to the room, are partial



Lighting Requirement Schedule.
The number, disposition and size of each circle indicates the proportional light required at that location to properly light the work. Summation of all the number and sizes of circles in a given room is the total light tax of the room.

indicators of the consumption, even these figures do not provide a true guide unless departmental lights be all turned on together. If this is done, especially where an automatic load record is provided at the controlboard, it is possible to keep track of the lighting item as a direct charge against each department. There still remains the separately lighted bench and dark corner, such as is found in a stock-room, etc.

In order to assure that these taxes upon the power supply are distributed to the department to which they belong, as a more or less direct charge, rather than purely upon a guess basis, the following method has been found to give results that are so closely in agreement with a check-up made on individual lights that the slight difference between the two figures may be disregarded. (It has the advantage of being a permanent basis of figuring the charges.)

The consumption of power in lighting is distributed as a proportional part of the total load for each day. This proportion is marked out as follows: For each department running, the relative effective lightness (by natural means) available to that department is figured by means of a suitable instrument such as a foot-candle meter. The plot made of each room, in this way, will show that one department either rates as the equal or unequal of other departments in its natural illumination asset. Then, within each department, a further detailed study is made of the operations, so that not only will those requiring best lighting be shifted to most advantageous positions, but that it will be brought out in what chronological order (in a day) the darker areas require lighting. From this whole survey is developed a "lighting requirement schedule" for the whole plant, a permanent chart, upon the basis of which the lighting requirement per department is figured. Naturally, slight changes will occur from time to time, but if the plant engineer will keep in even reasonable touch with department foremen these shifts may be recorded as made.

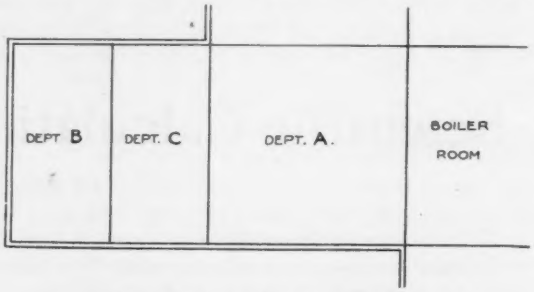
Three definite benefits are obtained from such a survey:

1. Better lighted work, reacting in a more efficient working force.

2. Economy in lighting cost, through most efficient arrangement of units and work.

3. More accurate distribution of lighting costs in inter-department and total plant overhead.

Heat. It is with some amazement that I have encountered the practice of distributing the heating bill in proportion to the volume of air space in the several rooms heated. It would be difficult to find a greater error in overhead calculations, due to the actual conditions which obtain in nearly every textile mill.



Distribution of Heating Expense.
The difference between the distribution on the basis of volume alone and the proper basis of calculation is as tabulated below:

	Volume alone	Proper figure.
A	2	485
B	1	467
C	1	364

To illustrate: Department A is situated next to the boiler room and has no direct provision for heating it, this being provided for by the warm adjoining walls and the heat from two steam lines passing through it to heat departments B and C. Department A is a large room, twice as large as B, in fact, and has one other blank wall in addition to the blank one against the boiler room, whereas Department B is an end room with three exposed sides and saw-tooth glass roof. Department C, on the other hand, is of the same size as B, but is under a second story and is exposed to the weather on two sides only, both ends adjoining other departments. Yet B and C are rated as equal in heat tax and both of them less than A. The excuse offered, when the obvious absurdity is pointed out of the hot department A requiring more heat than the cold one B is that "it may be out of proportion to the facts, but we have to have a constant basis throughout the plant!"

This is a sound enough *principle* of operation, but the

proper *basis* should be chosen, inasmuch as it is available. It is, briefly, as follows: Heating engineers rate consumption of radiant heat (capacity of radiation required) upon the following factors:

1. Area of wall exposed to weather.
2. Area of window space.
3. Area of wall unexposed to weather.
4. Rate of air change required in the room, per hour.
5. Volume of air in the room.

A certain number of "feet of radiation" are applied against each one of these factors, a percentage of the total added as a factor of safety, allowance made for incidental heat developed from the number of persons working therein and heat-producing processes of any kind, and the proper basis of heating a room is, thereupon, established.

The important thing is that inasmuch as this method stands the test of how to heat a room it also furnishes the proportional figure from which to estimate heat consumption in each department of a large plant. Incidentally, very little change from the one original set of calculations for this purpose need ever be made—the only ones are for a very marked change in the number of personnel, for addition or removal of an important heat-process machine, or a change in wall or roof status.

Industrial Steam. Particularly in finishing plants, bleacheries and dyehouses, as well as in separate units like calenders, the distribution, per department, of the live steam cost is frequently attended with marked error of an unnecessary nature. In the modern, well-managed systems of operation, close records of the time put in by each operative on every job are available from labor-ticket or time book. It is little extra effort, therefore, for the timekeeper or cost clerk to check against the machine-record for the day the total time during which the machine is operated to full capacity plus the time known to be necessary to furnish full capacity of steam to the machine in order to bring it up to working status. If, now, the cost department will provide itself with a layout board of all machines, plotting thereon the machine numbers and the capacities of steam each requires to perform its work, all the data necessary to daily checking of steam consumption as a *direct charge* against each department is at hand. Consumption per machine per hour is, of course, obtainable from the capacity of steam line delivering to each, in terms of whatever reduction of this capacity is effected by size of delivery pipe and whether steam is delivered by heat coil or by bubbling through a bath, etc.

Power. This problem is a composite of the methods described above, in the light current and industrial steam. Individual drive installations simplify it greatly, as this record, checked against machine-running record, gives nearly complete data. Discrepancies can be balanced from the record of total power used, allowing for consumption due to intermittent work (starting load) which the various natures of departmental work indicate as typical.

Supervision. Probably the best guide for distribution of this item will come from each superintendent, from his own diary or other records.

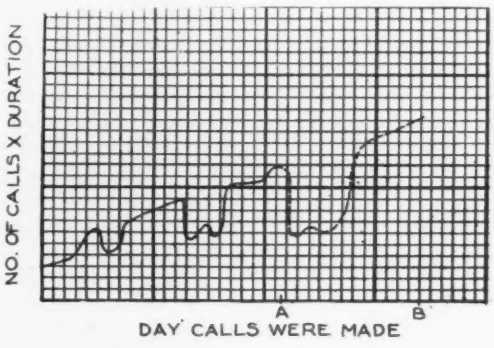
In general, while the condition is not, in any sense, such a fixed matter as to be capable of being shown in any arbitrary ratio over long periods, in all departments, it may be just that in departments where the course of events is undisturbed over years of time. Even here, however, the factors to be taken chiefly into account are:

1. Process-difficulty.
2. Number of personnel.
3. New installations of equipment.
4. Training apprentices.
5. New and unusual jobs undertaken.

Consideration of these five factors enables the superintendent or foreman to keep track of his time to good advantage; enables him to report any undue demand of each and to take account of unusual conditions and to remedy them.

It gives, further, to the cost department, the proper basis of distribution of executive time. Item 1 should be charged against the operation, 2 against direct labor thereon, 3 against the separate charge for new equipment going into machine inventory, 4 partly to direct labor of process and partly to welfare, and certainly a proportion of 5 should be charged to experiment and research. The balance of 5 is justly charged to the cost of the specific new jobs undertaken.

Indirect (unproductive) Labor. Labor charges for sweeping, trucking, handling and repairs can, very largely, be applied directly to the several departments they serve. A well-handled cost system can also distribute painting, oiling and other general plant-service costs directly from their individual job records. One very satisfactory method of handling certain maintenance crews is by distribution of their labor over each department, in proportion to the number and relative importance (in proportion to time taken) of the equipment they are called upon to serve in the several departments, regardless of the actual list of calls for their service. This is fair *only* when uniform grades and types of such equipment are served and the relative tax upon such equipment is similar in all departments. Since this is not always the case a safer method is to keep track of all calls and to modify the distribution factor in terms of this service-call record. The objection to all such procedure is that past records are not applied to past but to somewhat future costs. Considerable amelioration of this error is brought about through reduction of the data to graphical form and application to current cost calculations not of the past-experience figure, but the figure which ten-



"Future-Conditions" Graph of calls for Belt Service.
Full line of graph is the data as recorded.
Dotted line graph is the probable tendency of the data.
Point A is last official data available to date.
Point B is probable figure of this data at date when figure of overhead must be figured to in order to be constant throughout plant and to relate to a seasonal basis of establishing prices.

dencies in direction of the data-graph indicate as likely to be the figure which "future conditions" (the present moment of the cost calculation) will bring about. (See illustration.) This kind of a figure is more often truly representative of actual present moment costs than those obtainable by any other method.

An efficient executive dislikes, properly, to manipulate a vast amount of intricate detail—constantly shifting and of relatively small effect upon his general conclusions. On the other hand, it is, obviously, not feasible to recalculate each item mentioned above and its effects throughout the whole general cost figure.

Such a detail as handling the effect of a shift in the number of personnel in a department upon the heat cost, is a case in point. There can be only one answer, if truly representative cost figures are sought, and such as upon which reliance can safely be had. This is the use of adequate graphic record of the data, throughout. All this significant data, as soon as available, should be recorded in such form.

It is surprising how a mere survey of graphically set-up data clarifies many doubtful points and the ease of rightful interpretation of it is beyond question. Nor does it require an expert analyst to decipher it, if properly put up. One should look with suspicion upon graphical data which is not capable of more straightforward and significant scrutiny than tabulated figures.

Perhaps the most important thing to keep in view, in making and using graphs of this kind, is the matter of practical limits in the data. As the amount of an item changes it may or may not cause appreciable corresponding change upon the total figure of which it is a factor, at all times. It is important, then, to indicate the limits within which no change is caused upon the major or chief figure of overhead, and the points, the passing of which, starts to affect it—at times very markedly.

What Other Men Manage With

BY R. A. SONIAMAN.

Spooling and Twisting.

Before stepping into the spooling room, it might be well for the visitor to inform himself as to how the yarn progresses from the spinning room to the spooling department. Where is it stored previous to use at the spooler? In the spinning room? In the spooling room? Or in a room adjacent to one or the other or both? Is the spun yarn conditioned before spooling? If so, is there a special conditioning room? Latter-day practice is to dispense entirely with the conditioning of ring spun yarn before spooling; whereas mule yarn is still subjected to this procedure.

If the yarn has to be transported from the spinning department to the spooling room, how is it done? Are trucks used, or are the boxes or skips packed into a team and carted to their point of destination? Or are large wheeled fiber trucks used, these then forming the mode of conveyance? One plant that the writer visited was experimenting with such trucks for all of their spinning room products, the latter then being pushed to the elevator and taken up to the spooling room.

How is the yarn stacked after reaching the spooling room? In piles, with each count or quality by itself, so that there is no possibility of a mix excepting through rank carelessness? If the truck system is in vogue, are the different counts distinguished by tags giving counts and quality, and other necessary data? One plant having several numbers uses colored tags, one color for each number, the qualities or cottons being differentiated by a stripe of a dissimilar color across the tag.

The type of spooler is, of course, a first consideration with a visitor. Upright spindle, slow-traverse drum spoolers, or the fast-traverse machines of which there are quite a few makes on the market now. The first two use a headed spool, the other a headless tube, or cone, either wood or paper. See *A, B, C,* Fig. 1.

"I sincerely pity the poor fellow who has to put up with the old type of spooler using headed spools," one manager remarked when asked for an opinion of the merits of the different types of spoolers; "we discarded them all a few years ago, replacing them by the fast traverse headless type. We tested out both types thoroughly before making the change and we found that the advantage was with the fast traverse type in that

(1) A larger quantity of yarn could be put on each package thereby
   (a) decreasing the number of knots;
   (b) reducing the doffing by spooler tenders;
   (c) minimizing tangled units to a large extent.
(2) The cost of twisting would be decreased because
   (a) twisters could run more sides on account of the greater yardages on the units;
   (b) there would be less of the loss in production formerly due to units running out faster than the twister could tie in fresh ones."

What are the speeds of the spindles or drums? This is a subject that should receive careful consideration by every

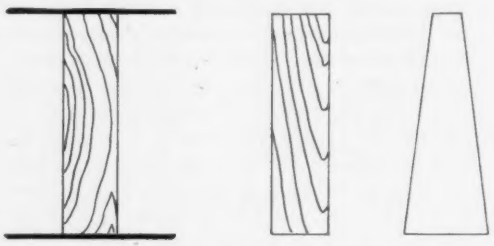


FIG. 1

executive when he is visiting a friend's mill. Too great a speed is sometimes bad for yarn, workers, and mill. For the former it means many and repeated breakages decreasing the quality thereby; for the workers, it means an automatic reduction in pay, a period of discouragement, terminating gradually in discontent, and eventually resulting in the operative leaving for some other mill; for the mill it means a poorer product, a new worker to teach, and a corresponding all round increase in the cost of operation.

On the other hand, a speed too low is also a costly institution for a mill in that it means a greater labor cost to spool; it means that to get a certain production, it will require more units or hours than would be necessary if the

speed were higher. These facts being so, just what is your fellow executive doing about his speeds? How did he arrive at his present speeds? Does he have a variable scheme of speeds for the different qualities of yarns he uses?

The difference between single and ply spooling is often as great as that between black and white. The simplicity of single spooling is well known, as is also the ease with which the average female worker can be taught this form of spooling. Ply spooling, on the other hand, requires a much longer period of training and a greater degree of skill necessary on the part of the experienced worker in order that the ply ends be properly kept together when piecing the ends. Split ends, single and double, are the big

FIG. 2

evils in ply spooling, and it is always interesting to learn how the next man scores with these imperfections.

If there are many counts, how are they handled? Every worker going in turn on a different number? Or are certain spoolers and workers assigned to one number more or less permanently? These are important questions, for on their answers often is open vistas of profitable practices hitherto probably not yet thought of or undertaken by the visitor.

What is the method for identifying the counts after spooling? Are the units packed in colored or tagged boxes, or put on boards capable of being properly distinguished? Are colored tubes used to differentiate the counts? Or is

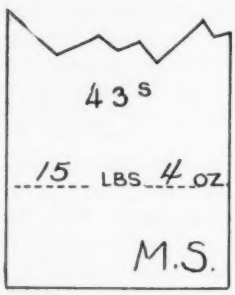


FIG. 3

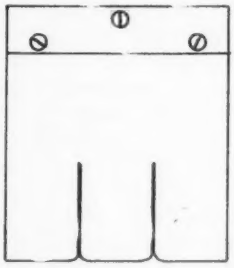


FIG 4

that ubiquitous, handy substance, colored crayon used? See stripe on package, Fig. 2. Crayoning is perhaps the most universally employed method and from the writer's long mill experience it certainly has much to commend it, particularly in the matter of preventing mixtures; for unquestionably one of the most interesting phases of spooling many counts is that of the prevention of mixes of the several counts. Any system different from our own always evokes our every attention to learn if it has points of superiority to ours. Therefore any number of questions on this topic is never out of place.

How is the yarn brought to the spoolers? Do the spooler tenders have to go after it themselves, or is it delivered to them? Do they have to sign for the receipt of the yarn? See slip, Fig. 3. Are they required to check the correctness of the counts before placing a single cop or bobbin on their machines?

In what way is a record kept of the production of the spoolers? Pounds, boards, boxes, units? If weighed, how is the weighing done, and by whom? And what relation has the method used to the payment of wages? If a piece rate plan is in vogue, paying so much a hundred pounds, what check is used to see that the pounds weighed for each worker are correct? It is a good plan whatever the system of checking to see whether the yarn delivered to the workers balances with that returned by them, taking into consideration, of course, waste and a slight invisible loss.

When many counts are spooled, with different rates for each number, just how are the different yarns allocated among the workers? Do some workers have the same counts all the time, or are the counts changed for each worker every so often? Both of these plans have been successfully worked, depending a good deal on the circumstances attending at any particular mill, the attitude of the workers, their intelligence, the variety of yarns, the quality, the speed at which yarn can best be handled, and so on, ad infinitum.

Sometimes it is advisable to keep certain machines on certain counts continuously, and with a proper degree of diplomacy it can be effected. Where the workers are tempermental, however, it may be necessary to change the counts on the machines, or move the workers to different machines. How does your friend handle this problem?

Closely related to the method and production are the types of tension and also the kind of yarn clearers used. The latter mechanism often has an adverse effect on production by reason of a close setting which causes a considerable breakage of the ends. How do they set the clearers in the mill you are visiting? What type of clearers do they find best adapted for their type of work? Clearers of divers kinds and forms have made their way to the textile market of late years, but the old, old type of slotted clearer is perhaps still in the van. See Fig. 4.

Are knotters used? Automatic or otherwise? Is there a specific length to the knot tails? It is surprising how a careless spooler operative will have a string of long knots showing up in different processes following that of spooling.

A fault that seems to have kinship in every spooling room, is that of operatives waiting for work. If the girls are on piecework, are they allowed anything if they have to spend part of the day in idleness, because of lack of material? "I don't believe in penalizing the workers for something over which they have no control," vouchsafed one executive; "if we see that we are going to run short of material we try to arrange to let all or some of the girls out for the ensuing half day or so; but if the shortage should come unexpectedly during the morning or afternoon, we allow the workers, during the time they are stopped, a standing rate equivalent to their average earnings." How do they take care of this detail where you are visiting?

Since the human is a being very prone to errors and as spooler tenders are not exempt from this failing, it might be advisable to ask how the bad work made at the spoolers is followed up. Are the workers summoned to the next process to look over their faulty work? Or is it taken to them? Is a record kept of the faults so found and charged

to the worker who made it? If a worker persists in making objectionable work is there a well defined attempt made to break her from the pernicious habit before discharging her? To whom is this task entrusted?

Spooler tenders are very apt to exceed the normal in the waste they make. Has your friend made any tests to determine just what can be expected as the minimum in the waste? How does it compare with yours? Is it alike for all counts? The writer will say for the benefit of those executives who have never made any waste experiments, that this waste minimum will vary with the different counts. For example, if it is 6 ounces for 50s, it will be about 12 ounces for 25s. The value of making such a waste experiment lies in the fact that it gives the management an instrument for estimating with a fair degree of accuracy the amount of legitimate waste that may be expected to be made. If this amount is exceeded, the superintendent can quite confidently give his spooling overseer a razzing about it.

A simple but entirely effective plan for the reduction of the waste to the recognized minimum, and its retention

SPOOLER WASTE

NAMES	M	T	W	T	F	TOTAL
S. PULER						

FIG. 5

at that figure is to post in some conspicuous place at the spoolers a list of the spooler operatives and each day credit the workers with the amount of waste that they have made for that day. See Fig. 5. Then, either daily or weekly, this amount can be compared with the standard, and the attention of the workers who exceed it called to the fact. They should be given an opportunity to explain if they can just why they had so much waste. And quite often they can give a reasonable and legitimate account of the cause. The trouble should then be eliminated, and the waste returns to normal. But sometimes a worker will persist in keeping up the unnecessary amount of waste regardless of how she is approached in the matter; therefore, a little more pressure must be exerted in the form of suspension for a period of time, a day, a week, or so. If this fails to bring results, a dismissal is in order.

Another thing to inquire into is whether knives are permitted. Knives sometimes get to be a pretty serious matter in those mills which spool ring spun yarns, because of the tendency of the workers to cut off the residue on the bobbin bottoms. Piece-workers particularly, are apt to slice off some pretty big chunks of yarn. What then, is the practice in following up this important matter and in keeping the waste down to the predetermined minimum?

When an accident happens to a spooling machine, causing bad work to be made, what is the course followed? Are the operatives trained to notify the section hand, or are they allowed to call every worker from band boy to trucker to fix their machines? This question may seem queer, but from the writer's wide experience it might be said that some of the practices going on would be highly amusing if the results were not so serious to the firms immediately concerned.

Storing of the spooled product is another phase of the spooling room practice to look into. There are various plans in vogue, some good, and some abominable. Mills using skips or box trucks and who have plenty of space have an ideal method of storing their products without the extra cost of moving the product from truck to floor and back to truck again, and so on. Handling the material in the baskets of a convenient size, and with racks built so that the baskets can be placed in them makes another good form of storing. Firms using the pin-board type of storage, so many spools to a board, combined with a rack system wherein each board can be slipped into a compartment by itself have another commendable way of facing this proposition. How is it handled by your guide? How do you handle it? Which method do you believe the most efficient?

One word more about the storage of spooled stock. The practice of leaving the material exposed in the open cannot be too strongly censured. Look around the plant you are visiting and see if this condition is extant. Are the spooled units left so that they gather an accumulation of fly and dirt that neither might nor main can wholly dislodge?

Twisting.

From the spooling department let it be assumed that the visitation will continue into the twisting department. For the twisting of ply yarns is a process of far greater magnitude than the average student of cotton manufacturing is apt to infer. Ply yarns for innumerable purposes, cabled and hawsered products for sewing threads, crochet, and fishlines, button threads, and so on and on, are all the product of the machine universally known in the United States as the twister.

The type of the machine will perhaps take the visitor's eye first. Is it of the so-called English or Scotch type? Are the bottom rollers of a single or double line? What about the cylinders? Are they single or in two lines? English made twisters are generally of the double cylinder type. Advantages claimed for this style are the economy of space effected by the smaller width made possible by the use of the two lines of cylinder; better driving of spindles because of the greater arc of contact and the more nearly approaching horizontal line taken by the bands.

Spindles are of several types and it would be well to ask a question or two regarding their respective value in the light of your friend's experience. One apparently insignificant accompaniment of twister spindles is the lock whose job it is to keep the spindle blade from being pulled out of its base. Twister bobbins have an inherent capacity for binding on the spindle more or less, even if a careful system of reaming is extant. It is, therefore, of the utmost importance that the lock be one which will function effectively; because the efficiency of the department can be ad-

versely affected by a poor working lock. There are some makes of spindle locks which do not stand up so well under the steady strain of daily work. But there are some really good spindle locks, English and American made. What kind have they in the mill you are giving the once over? Do you feel envious? Or can you congratulate yourself on the type of spindle lock you have?

While speaking of spindles, there comes to mind the matter of gauge—spindle gauge. As the writer has already said about the spinning frame, so, too, is the trend in twisters toward a larger gauge. About one inch larger makes a good distance, if the spindle speed is not too high. That is, too high in the sense that there is such excessive whipping or ballooning of ends when the bobbins get beyond the half-full point that it may be necessary to doff the bobbins when only three-quarters full, or have the frames in a badly "busted" condition. In this latter state, it will be readily seen that rather than a gain there is a distinct loss from the higher speed.

Ring rails on twisters are, at the present time, perhaps universally made of the cast iron type, the rings of the upright type having a shoulder on the outer rim which per-

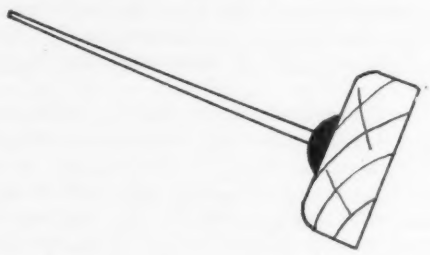


FIG. 6

mits setting it to its proper bedding and then a screw or two holds it fixedly in place in the rail. Do they have a different type where you are visiting?

Creels of twisters in this country are usually of the porcupine type, excepting in the case of beam twisting. Some mills use a high many-storied creel to twist ply-yarns in multiple; others arrange their creels with a width between pins sufficient for a large size parallel tube from the winding machine. This latter method has an advantage in that single is less apt to be made. Just how are the creels made you are looking at? Mills using spools and heavy tubes of fine yarn will find it advantageous to have an anti-friction iron or porcelain buttons, Fig. 6, on the creel pins. Their use will save the mill money both in production gained and waste eliminated.

Is the twisting wet or dry? Yarns for strength are usually wet-twisted; yarns for which a soft feel is requisite are generally dry-twisted, as are also yarns used for crochet work or other fancy articles. Such yarns are singed to remove the extraneous fibers projecting from the body of the yarn.

What is the type of bobbin, and what the method of operating the bobbin traverse? Is there a knobby upper head to the bobbins as in *A*, Fig. 7, or is there just a small bead, like that in *B*? Does the traverse build a receding taper top, in which the first layer runs the full length of the bobbin, and then each succeeding layer just a shade less, building a top like that depicted in the sketch, Fig. 8, by *A*; or does it run the full length of the bobbin each time making the tapered effect by the shape of the cam, see *B*, which causes the rail to travel faster near the top?

The advantage claimed for the former build is that the bobbins will run off better on the reelers; whereas in the second type, the bobbins sometimes overrun, causing the ends to incorporate with neighboring skeins, to catch on the guides, or snarl at the tops of the bobbins. The rea-

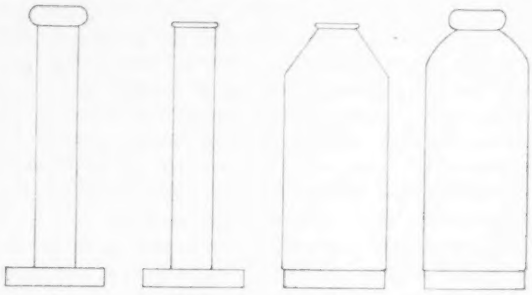


FIG. 7 FIG. 8

son for this is readily seen when looking at *B* in Fig. 8. Since the end runs right up to the top of the bobbin taper at each movement of the twister ring rail bobbin-traverse, it follows that it unwinds in like manner at the reels. Therefore, when the end is being unwound from the very top of the taper, the bobbin is revolving faster than it does when the end is at the base of the taper. It is this higher speed of the bobbin brought about by the taper and which is continued for a short time even after the end reaches the taper base or parallel part of the bobbin that causes an unwinding of a portion of thread greater than can be taken up by the revolving reel. It is this slack stretch of yarn that gives all the trouble.

It may be said against the first method that if the receding characteristic is not carried out at a proper angle, tangled bobbins, roller waste, and loss of production might ensue. For example, *A*, Fig. 8, shows a taper that will give good results. Too long a taper will decrease the

FIG 9

amount of yarn that can be wound on the bobbins, and hence, more frequent doffing and a consequent greater loss in production. Too short a taper, on the other hand, depicted by Fig. 9, will cause the rounding effect shown, a deficiency of taper which the centrifugal force of the revolving bobbin will soon reduce to a state of entanglement. What has your friend to say about this?

Another point to inquire about, one which has a large bearing on the good and bad running of twisters, is that

of the distance between the guide-wires and the top of the bobbins. Too long a distance will cause ballooning, ballooning results in breakage of ends, and breakage of ends brings the inevitable train of excessive waste, tangled bobbins, and loss of production. What are the distances you are looking at? Are the threadboards adjustable for this perpendicular distance?

Coming back again for a moment to the driving of spindles. Are they band or tape driven? Modern mill practice is inclining more and more toward the tape. The longevity of a well woven tape of good material gives it far and away the advantage in the matter of a high efficiency in spindle driving ability. Tape twisters have a device on each tape carriage which automatically compensates for the contraction and expansion of the tape through atmospheric conditions. How nearly does this coincide with your guide's opinion of the tape as a spindle driver?

As between the tape and the band in so far as the effect on the twist is concerned, it might be said that there is little, if any, difference in the uniformity of the twist inserted by either method. That is to say, the variation in each individual end is identical in both systems. But with the tape, slack should be an unknown quantity, something that can not be said for the band.

To settle the question of variation definitely, take 10 bobbins from 10 consecutive spindles from a band driven frame, and do the same with the tape twister. Try each bobbin once in the twist tester, jotting the result on a pad. Total, then average, and finally compare the two. Analyzing the twists, bobbin for bobbin, it will be found that there is just as much digression from the average in the one as in the other. Ask your friend if he has ever made this test.

The composition and make-up of the band is well worth inquiring about. Is the band of cotton? Is it of yarn or roving? Twisted or braided? Impregnated with a chemical? The writer has found that a braided band of roving makes a pretty good band. A part of the success of longevity is essentially bound up in the matter of making bands the right weight for the size of the load they have to carry. It is absurd to expect a number 20 to successfully carry a load of 12 or more ounces. The band will simply refuse to stand up—slack will follow, the band eventually and prematurely collapses. Is this not your experience? Is it your friend's?

What is done in the matter of testing the bands or tapes for slackness? Does the mill you are looking over have an instrument for testing the slackness of the bands or do they do it in the age-old way by pressing a leather finger pad on the spindle jacket? How often are the bands tested?

Tapes have an automatic regulator to take care of the effect of atmospherically caused length fluctuations in the tapes, and if the tapes are of the right length when put on, little trouble may be expected from them as far as slack is concerned. It is quite possible, however, that the carriages may become clogged from an accumulation of dirt, grease, rust, water, and so on, a condition adversely affecting the free movement of the idler. It is sometimes necessary to take the carriages out altogether and cleanse them with a hot sal soda solution, or with kerosene or gasoline. What does your neighbor do in such a case?

What about the bander? Is he a boy or man? And just how does he do his work? Is there a special way of tying the bands and sewing the tapes that the firm insists on being used? How many bands or tapes does he put on during a working day? Does your experience coincide with your guide's in this matter? The writer's experience is that a good square knot tied with some understanding of the atmospheric effect on the band will go a long way toward a success of the bander's job.

Spindle speeds are immensely important and should be thoroughly discussed with the thought in mind of getting the benefit of the other man's experience. Too high a speed may wreck a twisting room; whereas too low a speed will reduce a mill's profits. But sometimes a man will acquire a wrinkle that may help him to maintain successfully a speed that he had hitherto thought impossible. Have they made exhaustive tests in the mill you are visiting in the hope of striking that one speed which would give them the maximum production of the highest quality?

Mills making a variety of yarns of different counts and divers plies have to look well to their ring sizes in order to get the most desirable results. How is your friend making out in this matter? Is there a ruling that the coarser counts and the multi-plied yarns are to go on the largest rings, the coarser the count the larger the ring it is put on? And does the spindle speed range conform inversely with the ring sizes? Decreasing as the ring size increases?

One of the hardest worked midgets in the twisting department is the ring traveler. Going at the rate of several hundreds of miles a day in a small orbit, it will, if given the proper care, unceasingly make good at the three functions which the insignificant appearing traveler has to perform, to-wit: 1, twisting; 2, winding; and 3, confining the ends of yarn within the borders of the gage of the frame.

It is highly interesting to find out just how long other people run their travelers when on the same counts as yourself, the spindle speed and other conditions being identical. Also to compare the size of the traveler used for the same counts. And whether the shape of the travelers is like the kind you use. And if not, why the change.

It is likewise enlightening to learn how other people find spindle speed affecting the weight of the traveler used. Has it been found that an excessive speed requires a heavir traveler and that a train of evils sometimes follows thereafter? How are the travelers lubricated? Are they brushed? And how often lubricated and brushed? What is done with the old travelers?

What is the composition of the lubricant used to reduce the friction between the rings and travelers? Is it stable in quality? Does it retain its consisteney summer and winter? Or is it hard as stone in cold weather and like an oil in warm weather? If a firm is large enough to warrant it, the writer believes it would pay to have a small rendering plant to re-melt the grease purchased and then add such an amount of oil as will give the desired consisteney.

Is there a ruling regarding the method of applying the lubricant to the rings, or the amount to use, say per 100 rings? Greasing of rings is one of the most important operations in the twisting department, and should, therefore, be one of the subjects for an exhaustive discussion. Is the old discarded grease used as a lubricant for other parts of the machine? Even though the lubrication of the rings be very properly done, trouble can still be expected

if the rings are allowed to get into a bad state of corrosion —usually known as rusty. What is the ruling in connection with keeping the rings in as bright a condition as possible, that the path of the traveler may be a smooth one? This is extremely important, because badly rusted rings mean that every time the twisters are started, especially if there is but little yarn on the bobbin, there will be anywhere from a quarter to one-half of the ends breaking. With the consequent result that there will be an immense number of knots added to the product which need not be, if the rings are kept in proper shape. How do the rings look, anyway? Show signs of chattering, waviness on the edges and inner side?

How are the full bobbins doffed? With the frames stopped or running? Who does the doffing, men or boys? Is the doffing a standing pay job, or is it on a piecework basis? Is there any trouble keeping schedules, so every frame can be doffed just at the time that the bobbins have filled to the size which experimentation has shown is the most efficient?

It is perhaps unnecessary to say that systematic scheduling of twisters will mean a greater production and smaller amount of unnecessary stoppages. It would also appear superfluous to mention that a production increase will accrue in those rooms where the doffing can be done with the frames running. But it is a fact that the writer was recently in an old established place which had a large twisting department with medium sized rings, twisting medium ply yarns, porcupine creels, using headed spools, where the doffing was done with the frames stopped! There was absolutely no reason why the frames could not have been doffed running, and much more speedily than when stopped, if the help had been trained to doff in such a manner. How are they doing it in your fellow executive's establishment?

Are the twister tenders on piece work? If so, how was the piecework settled upon? And how does it operate? Is it productive of a higher degree of efficiency on the part of the operator than the age-old system of standing pay? What is the piece rate based on, reading of a hank clock on the front roller? Or the weight produced? The writer prefers paying by weight whenever the weighing can be managed economically. Obviously, however, the recording of the clock readings is a far simpler and less expensive process than that of weighing the product of the machines.

How much of the cleaning of the machinery is done by the twister tenders? If none, who does the cleaning, and how often is it done? Particularly on those twisters running coarse counts and short staple cotton. A glance along the deckboard of such machines brings to mind a heavy snowstorm, so thick is the lint being shed from the units in the creel. And unless frequently cleaned there is always a possibility of this fly waste becoming incorporated in the product.

Probably one of the best indices to the condition and running of a twisting department is that of tangled bobbins. Where there are many of these unwelcome lingerers, it shows that something is at fault. What is the system for following up and keeping down the tangled bobbins in the mill you are looking over?

Has any test ever been made to ascertain the effect of different builds of bobbins on the number of tangled bobbins made? As has been previously pointed out, that type of traverse which carries the yarn the full length of the bobbin at each course and yet makes a taper top gives the better results in the matter of a minimum of tangled bobbins.

Tangled bobbins mean waste, for the yarn is either entirely cut off from the bobbin or sufficient yarn is removed by finger manipulation to remove the tangled portion. But in either case, waste is made. It is simply a matter of degree.

Speaking of waste from tangled bobbins brings to mind that the waste problem in a twisting room is often a most terrifying one to the overseer and superintendent. How seriously is it taken in the mill you are visiting? Does the mill have a pretty accurate idea of how much waste may be regarded as legitimate from the twisters? For each class of work and count?

Twisting waste may be classified somewhat as below:

Roller lap waste.
Single yarn waste.
Double yarn waste.
Tangled bobbin waste.
Mixed yarn waste.

An examination of the waste will usually disclose the proportion of each, and steps can be taken to bring about an improvement when any single item shows an excess.

It will also be found that when such a check is kept on the waste of individuals, that each twister tender will show up every imperfect waste-making spool from the spooling

FIG. 10

department. If no attention, however, is given to the amount of waste made, the twister operatives obviously will rather fix the spools than to have a derogatory epithet applied to them by the spooler tenders; whereas, on the other hand, a carefully followed up waste plan will compel the workers to disclose the source of the bad work as a matter of self-preservation. Indeed, after the system is working smoothly, no offense is taken by anyone of the workers if her poor work is shown up at the succeeding processes. Rather, they expect it to be shown up, and they will make special efforts to turn out only an A-1 product. They take a pride in having a 100 per cent perfect product. How about it?

An exemplification of the old saying that even a worm will turn is that of the bottom roll of the twisters, particularly the single line brass bottom roll of a wet twister. Often revolving at a high rate of speed, one will find the necks dry, rusty, some with a chunk of waste, some with a hunk of grease as dry and hard as stone—in fact, in anything but the condition that this roll should always be in. How are those you are now looking at? What kind of lubricant is used? A good grease, frequently but sparingly used makes a good lubricator.

The practice of putting a big chunk of grease in the bearing, either with a special little chamber as a container

(*Continued on page* 486.)

Scientific Trends With a Textile Slant

The Foundation Stone.

So much depends upon the decision of what material shall be the dominant one in property replacement or new construction that the results of a recent survey of experience with various building materials used in a very extensive region is not without significance.

Tracing the development of building styles from the early days of log buildings, through the period of using natural stone and then into frame construction and finally fireproof materials it was demonstrated that whereas frame buildings greatly outnumbered all others this seems to have been due largely to the expansion of the lumber industry, chiefly because of the facilities that industry offered to prospective builders. Significant of the whole matter was that the lesson of city construction had tended altogether toward more fireproof construction (and cities, like factory buildings, are closely grouped). Also that for the entire history of construction investigated, clay products and allied materials were found to be preponderantly the most economical for all exterior construction.

It might do to go deeper into the data and cite the decreasing margin between lumber and clay-products cost, but this historical evidence alone, regardless of the future tendencies, seems to be sufficient to show which way the wind blows and to recall and emphasize the lesson of the man who "built his house upon a rock."

What Regulator Shall I Buy?

The amazing growth in the number and variety of automatic process control and recording instruments makes it necessary to fix some standard by which they can be evaluated, in order to choose those best adapted for routine process work. While each specific line of work finds this or that type more suitable than another, certain qualities are to be expected in any such equipment which shall differentiate it from a piece of laboratory apparatus. Each should measure up to certain tests:

Construction. Rugged, against vibration and chance blows. Protection against process corrosion. Long-wearing moving parts. Simplicity of replacement or alternation of parts.

Performance. Positive-action record making. Breakdown notification feature. Little adjustment to start new record. Requiring slight energy to make function.

Records. Simple and of effective length. Well-proportioned recorded variations. Data more expressive than tabulated figures. Capable of permanent and convenient filing.

When the apparatus aligns with such specifications a small price differential between it and a competitor is of small matter, in the spread of its cost over its useful span of production.

A Dollar Down.

Certain manufacturers of building materials purpose to extend the scope of their selling by putting their products within reach of those who can buy them only on a term- and partial-payment basis.

Have we become so thoroughly sold on the "daily inventory" idea of stockkeeping that our long-term vision is becoming altered to the same habit of thinking? Actually, do we work for a daily balance or for a future position of security?

There is, of course, no evidence to prove this to us, but we suspect that most millionaires and most great corporations became so, not through reliance upon "doing each day that goes by," etc., but as the result of a deeply-laid structure of long-time policy.

Isn't executive success dependent upon thinking in terms of year-spans, cycles and decades—and leaving the daily inventory job to clerks?

In these days of high costs and oftimes doubtful markets why shouldn't the privilege be extended also to the large-volume reliable customer, the manufacturer with a large plant to maintain? The practice of writing off improvement and maintenance costs over a long inventory period merely smooths the feelings—it does not lessen the capital burden borne by the owner who has to find the capital in the first place or else deprive himself of ordinary necessities for the prevention of depreciation.

Especially since the supplies manufacturer is benefiting himself primarily in the sale he should bear this burden of financing, and no one will object to a legitimate levy of interest on the customer until the full amount is discharged. It is just as logical as a bond issue for road improvement.

Diversification.

The increasing variety and sales opportunity which combinations of artificial silk with cotton have afforded manufacturers recently points to an undoubted tendency toward more and greater use of this new fiber. With all the problems it entails it is bound to be an advantage to many cotton manufacturers to add it to their stock in trade. The points of its similarity to cotton, in treatment, should prevent it hampering operations.

One of the greatest advantages which is bound to result from the newcomer is the tendency it will foster to shake the old time standard-cloth man out of his routine ideas and stimulate his energies and abilities toward more creative work. Even a denim manufacturer would soon fall behind the procession if he never altered old methods. The amount of alteration which the technique of the new fiber requires will set and keep the variety manufacturer on such a program of study that he will admit of ultimate defeat from no single field of textiles.

That Carry Over.

The old question of how much of a mill's production is standard and may be accumulated safely, therefore, during a slack season of work takes on a new significance with the realization that modern expensive machinery does not pay for itself unless worked very nearly to capacity.

While it is true that this consideration has greatest bearing upon design and most useful types of equipment for certain specialized branches of manufacturing, the points for the average mill itself to consider are still *how much* and *what kind.*

The answer must be found in interpretation of the experience of the past, with one eye always on the general trends of the times which are likely to affect our own immediate problems. We recall that the great war made black a thing of every day in France, yet the post-war period swung back, very quickly, into lines and vogues that

had their origin not of the immediate situation but of the universal and chronological cycle of style of all time.

So it is, always with the manufacture of such products as textiles: immediate conditions beget sharp pictures which require a violent or otherwise adaptable setting, but the greater proportion of all elements of life is made up of effects having their origin in causes derived over a long period.

It will be the purpose of some later groups of Trends to present figures bearing upon these built-up causes, so that extension of the data given may enable whoever would peer into the future to draw conclusions, for himself, as to the outcome to be expected.

Human Relationships in Industry

BY W. M. McLAURINE.

Records and Reports.

It is a very interesting study in industrial life to try to look back in the files of various organizations to find or try to find information. In many files are found exactly the kind needed, and in a usable form. In others there are volumes of useless information, useless because of the way it is gathered, useless because of the way it is filed, and useless because it does not contain accurate information.

Many people in subordinate positions, because they do not have a seemingly suitable office or equipment, make no effort to keep any records for their own information. Whatever records or reports that are required of them are handed in to the superior officer and the pencil or pen is dropped down and the incident is forgotten.

Records and reports are sign boards which indicate direction. They are valuable for everyone. We all may remember our lowest record or our highest record in any undertaking but the great average is only a general idea. We often know the group average, or any statistics, etc., relative to a general action, but detailed information about certain facts are often approximate statements or memories.

I recall this incident which occurred while I was conducting a series of conferences in a cotton mill. It seems that a certain employee either received a slight injury or contracted an illness, the cause of which he attached to the job in the mill. No one took a serious attitude toward it, and very little record, if any, was made concerning it. Some time after that, the employee died, and his death was held attributable to mill causes.

The mill had no records of any value, memories were poor. The case was an extremely difficult one to handle for both parties. If the mill was disposed to pay the claim, it had to be taken care of by the Insurance Carrier, and certain definite information was necessary for the Insurance Carrier to be convinced of the justice of the claim. If the case was not one of merit there was nothing of a positive nature in the records to indicate that it was not.

Doubtless, there are many cases that various members of the group may be able to bring forth, wherein records were not available and proper reports were not made.

It must be borne in mind that the records and reports we are projecting are the records and reports that the operating executives are required by the central office to make out and keep for the benefit of the office. Furthermore, it occurs to me that each operating executive should have certain records in his own files; such records may be those of his own making and observation or made from reports obtained from sub-executives or the operatives.

There are two cautions that perhaps should be injected here. Only records that are of value should be kept. Too many records and details are confusing and expensive. Second, an operating executive must judge the distribution of his time in the keeping of these records. In other words, an operating executive can not handle his job successfully in a swivel chair reading reports and studying records. He must get over all of his responsibility points and records and reports are only a part of them.

The objectives of this conference are:

1. To get the men to see the value of records and reports.

2. To enable the men to see the qualifications of good records and reports.

3. To enable the men to decide what records and reports they need for their own files in order that they may have a more efficient department.

4. To discuss some of the forms that will be of value to them.

I. Value of records and reports:

1. They enable foreman to visualize his department.
   a. Physical picture instead of mental.
   b. Relative condition of different parts.
      (1) Raw stock—finished product.
      (2) Present stock—orders on hand.
   c. Present condition as compared with previous conditions.
   d. Operative efficiency—as of whole and of different parts. (a) Planning. (b) Hiring. (c) Placing. (d) Routing work. (e) Time. (f) Costs. (g) Etc.
   e. Substitutes facts for memories.
   f. Prevents guess work.
   g. Prevents errors and disputes.
   h. Relieves mental strain.
   i Assists cooperation.

II. Characteristics of a good record or report:

1. They must be correct.
2. They must be complete.
3. They must be kept up to date.
4. They must be legible.
5. They must be on time.
6. They must be concise but clear.
7. They must have definite purpose.
8. Man making report must understand the purpose of report.
9. Report must be made to right person.
10. Report must be uniform.
11. Report must be dated and signed.
12. It must be easy and simple to make.
13. It must be easily understood.

III. Kinds of Records and Reports:

1. Ordinary or routine records and reports.
   a. Daily production.
   b. Stock on hand.
   c. Waste.
   d. Spoiled work.

e. Supplies requisitioned.

f. Delivered work.

g. Shop orders covering production.

h. Attendance record.

i. Delayed work.

2. Other records and reports that may be of value:

a. Record of "shut downs" and reason.

b. Transfer of employees.

c. Labor turnover. (a) Number leaving. (b) Number hired. (c) Number discharged and (d) Number quitting with reasons or cause. (e) Labor turnover percentage.

d. Accidents.

e. First-aid treatment.

f. Condition of machinery and tools. Care of machines Date of installation. Date and nature of adjustment. Date of repairs. Suggestions.

g. Repairs to machines and time "shut down."

h. Oiling record.

i. Idle machines and reasons thereof.

j. Enforcement of company policies. (a) Nature of policy. (b) Percentage of enforcement. (c) Remarks on difficulty of enforcement. (d) Conclusions.

k. Instruction.

l. Promotion of interest. (a) Characteristics of person or persons to be interested. (b) Interest factor to be utilized. (c) Remarks on success or failure. (d) Conclusions.

m. Safety first record.

1. What kind of records do you keep with reference to tardiness of individual employees,

2. When you speak to an employee about tardiness do you have such facts, as number of times tardy, dates, time lost, reasons given by him for such tardiness?

3. Have you any records that will enable you to compute cost for tardiness?

4. Do you keep any record as to how you handle cases of tardiness?

5. Do you think that any records or reports on this subject could be outlined, that would be of value? Why?

6. Ask the above questions and substitute "absenteeism" in the place of tardiness.

It may be of value to pause here and endeavor to work out a record or report sheet covering tardiness and absenteeism. Both could be covered in one report. It may be considered impracticable to use, but an academic study in the making of such a form, indicating the information wanted and the form in which it is wanted will be of value in an appreciation of records and reports that are deemed necessary.

Machines.

1. Do you know the maximum efficient production capacity of any machine or group of machines or a department under certain conditions?

2. Do you know the daily or weekly average of same?

3. Have you any record of any improvement or suggestion made which increased efficiency or relieved a hazard, etc.?

4. How many idle machines did you have yesterday, or last week? Why?

5. How long were any of your machines idle during yesterday? Was this a fair average?

6. How many times has any machine been repaired during the week or month just past? What was done to it and why was it necessary?

7. When did you install any new machines? How have they affected your efficiency?

8. Have you general ideas on all of these subjects, or are your answers based on facts?

Although the group may feel that many records and reports of this nature are immaterial and such a discussion is of no value, this is not true.

A second problem that may be projected is: work out a system for records and reports on care and operation of machines. Indicate, installation date, maximum production under certain conditions, repairs, idle time, accidents on same, causes, etc. Whatever the group may deem that will be of value in making them more alert and capable of greater bodily and mental ease and greater efficiency on part of worker and machine. No suggestions as to form are given here, but a suggestion that the group shall be governed by "characters of a good record or report" as indicated in Section II of this conference.

After such a form has been discussed and made to the satisfaction of the group, it may then seem unwise to use it, due to the time consumed in keeping it, and the educational ability required. I am inclined to think that if these two reasons are the only two offered, that they are not legitimate, as well planned and well supervised work takes into consideration a distribution of time, and those who are required to make the reports can soon be instructed sufficiently to enable them to keep them. I am inclined to think that if an industry has within its group men capable in all respects except the educational ability to write or keep a simple report, the industry has not properly discharged its duty toward that man until it has provided a way for him to receive such instruction.

Labor.

1. How many jobs are there in your department now?

2. Have you too many or too few?

3. How many people have you hired this week or month to keep these jobs running?

4. How many have left or been discharged and why?

5. How many cases of discipline have you had? Who were the people, and what was the cause? How did you dispose of them?

6. How many transfers were made? Who, when, why, where?

7. How many people are living in our villages? How many workers? How many possible workers?

8. How many cases of discipline in village? Who, when, why?

9. Village conditions—what records have you about this subject that will be of value in your department?

10. Suggest other topics that will be of value to you, if you had some record or report that would enable you to properly interpret your labor.

Materials.

1. What record do you keep on materials used during day or week?

2. Time consumed in process? Cost of operations on material?

3. Waste on various machines? Waste per employee?

4. Have you any records whereby you can compare costs of production at various periods and under various conditions?

5. Have you any information as to flaws, possible causes

(*Continued on page* 470.)

Be Cam

BY UBETTER DODGE.

Fire cracker tempers are not always an inheritance passed on by fight-loving forefathers. When a financial executive or a mill superintendent begins to fill the circumambient atmosphere with contumelious epithets disgorged with an eruptive violence somewhat akin to or at least resembling the exhaust of a loaded army truck on a heavy grade, it is frequently because of some local irritation that has placed upon tense nerves the last straw which was all that was necessary to upset an ordinarily equitable disposition. In the accompanying word picture Ubetter Dodge has brought in some characters who will be recognized with glee by mill men everywhere. They are confined to no section nor to any specific lines. Their faults and virtues are on a par with other average individuals. Their misfortune is that they occasionally time their approach inopportunely.

"Permanent wave in de boss' pants. Flat iron, come dis way. Git connected. Whereat's 'at sponge? Anybody want high tone pressin', see Zach. Do it if I has time. If it de boss man's, do it anyhow. Iron, git hot! Ole burnt out iron gittin' mighty slow, or else de juice weak. Flat iron, electrify yo'sel'f, let's put in dese hyuh radio wrinkles."

Zach, the office boy of the Whatsname Mill, searched through the pockets of a pair of pants belonging to Mr. Watt Tell, the superintendent, and not being rewarded with anything more profitable than a hole gave the garment a perfunctory sponging and laid it out on the table in pressing position. He spat upon the bottom of the iron with unsatisfactory results, placed it on top of a tin bucket that stood handy and subsided to the edge of the table. "Iron git hot turreckly. Mayswell be cam. Hurry-up was what killed most folks, anyway." An uncomfortable object with hard square corners which obtruded itself between his personal feelings and the edge of the table resolved itself upon investigation into a mouth organ in his back pocket. He dragged it forth, blew into it front and back to free its keys of stray tobacco crumbs and cupped it between his palms. "African saxophone, bust loose. Lost John, find your way." Enwrapped by a pair of large and prehensile lips on one side and spanked systematically by a pair of flapping palms on the other, the harmonica was helpless. To the accompaniment of waving elbows, swaying body and patting feet the weird strains of Lost John began to permeate the otherwise already well occupied atmosphere of the basement and ascend the stairs toward the boss man's office.

Mr. Watt Tell pulled out a handfull of hair and groaned. "Of all the production reports," he informed himself, "that I have viewed in a long and sinful career, this is the worst. That cloth room overseer has swapped the percentage figures on the production and the seconds, or I'm a farmer. If this report's right, the undertaker's going to have a job. Zach!"

Lost John hesitated, stumbled, stopped and remained lost forever. "Yassuh, comin' right up." Zach bounced up the steps, received instructions to find the cloth room boss and bring him to the office, and departed forgetting all about the flat iron heating atop the bucket. The longer the iron thought about it, the hotter it got.

Mr. Tell resumed his accumulation of figures from the report, and a corresponding loss of hair consequent thereto. A sudden draft of air on his rapidly increasing bald spot warned him of the opening of his door and he looked around to see a large, overdressed individual come in, deposit a sample case on the floor and seat himself comfortably in the chair that the overseers called the electric chair because they had to sit in it when they got jacked up.

"Blamlam," exploded the newcomer in a loud voice as he grasped Mr. Tell's hand in a powerful grip and tried to wring it off. "Marcellus H. Blamlam, junior member of and sales engineer for the famous firm of Blamlam, Bimbam and Banglang, bell founders. We make the best bells in the world. Our fame is rung through the world daily from the tongues of the millions of bells we have made in the thousand years we have been in business. We made the Liberty Bell, the Diving Bell, and the Belle of the Ball. Ha ha."

He thumped the super between the shoulders and knocked his glasses off on the desk. "Hell's bells," shouted Mr. Tell jumping to his feet. "What the—"

"Keep your seat" laughed his visitor. "We made them too. Now don't you tell me you've got a bell. I know it. I saw it as I came up. That's my business. If I can't see 'em, I can smell 'em. Now don't tell me one bell is enough. I don't want to sell you one bell. We don't make 'em that way. We make 'em in sets. Chimes, you know. I want to sell you a full set of eight bells for a chime, like churches have. Get the idea?

"Now maybe you've never thought of that, but I have. That's a new idea in industrial plants. Now you listen while I give you this and you'll see the advantage of it. I'll guarantee to increase the general efficiency of your plant twenty per cent by a set of Blimblam chimes. How? Simple enough. Play an appropriate tune for every occasion. Suppose it's getting up time in the morning. Your watchman. instead of jarring your help awake with the clamor of an old iron bell, brings them softly into the consciousness of a new day with some familiar air, skillfully executed. Listen."

He jerked from his sample case a small set of bells and set them on the desk. A long nose belonging to the cloth room boss appeared at the crack of the door and then disappeared in the direction of the mill. Mr. Tell shuffled his feet and wiggled in his chair. "I'm afraid you'll have to excuse me," he said. "I'm sort of busy."

"Not at all," said his visitor. "Don't mention it. Now listen to the getting up tune," and with a little hammer he played on the bells Please Go 'Way and Let Me Sleep. "How's that?" he inquired. "Do you think that when your operatives hear that ringing through the early morning air they will wake up with a grouch and drag down to work like a convict gang? They will not, sir. They will spring gladly up to greet another day of opportunities. Listen to this now, for the lunchtime tune, to be played at the noon hour."

Mr. Tell clapped his hands over his ears, but still he couldn't help hearing the drummer play Pass Around The Bottle, and We'll All Take a Drink. He stood up, grabbed the back of his chair and swung it over his head. "Get out!" he shouted. "I never heard of such a fool thing. Beat it before I break a chair."

"Of course that tune would have been more appropriate B. V. D.," the drummer went on not paying any attention to his threats. "That means Before Volstead Days, ha ha. My little joke. But you can rest assured we can work out everything all right. In case of trouble you have the unlimited resources of our engineering research department at your command. Now I've just thought of a good one. Every Saturday afternoon about four o'clock, when everybody's lunch has had a chance to settle, have the watchman play We Shall Gather at the River, and if you'll just enforce that, the general health of the community will be increased by—"

Mr. Tell brought the chair down on Mr. Blamlam's head, dragged him out into the hall, sent Zach for the cloth room boss again and resumed his study of the production report. Through the half opened door there oozed a slim, slick little man who perched on the edge of the electric chair and coughed discreetly.

"Naggle," he announced timidly. "Sales engineer for the firm of Naggle, Chawchaw and Snuffspitz, tobacco manufacturers. I have been entrusted with the important commission of bringing to the attention of the textile industry, Mr. Fell, the latest scientific development in cooperative manufacturing, an innovation, I might say, Mr. Well, which will be far reaching in its consequences. I refer to our well-known Efficiency Brand of tobacco products."

"After an immense amount of research work, our engineering department, Mr. Pell, has developed a line of products which can be applied to various uses in the mills. Take for example such a simple article as a tobacco box. You would naturally think an empty tobacco box the most useless thing on earth, but if you should learn that it was made of a very high grade of sheet steel of the correct thickness to be used as a card gauge, you can easily see that it might be a very valuable thing. So we have put on the market, Mr. Mell, the famous Five, Seven and Ten Gauge Snuff, which is contained in boxes of this thickness. Heavier metal is used for our Twelve, Fourteen and so on Pipe Plug. You get the idea. We also make the popular Creel Step chewing plug, the tags which are made by a special process so as to serve as creel steps on the roving and spinning frames. The adoption of this piece of goods alone will increase your production twenty per cent."

The cloth room boss' nose again appeared at the crack, accompanied this time by an inquiring eye which blinked a couple of times and followed the nose back to the mill.

"A special feature of this Creel Step plug," droned Mr. Naggle, "is the fact that it can be furnished in any length piece desired which, when necessary can be used in the place of belting. We also make a twist tobacco which can be ordered in any length or size and can be used for transmission rope, card bands, or spinning bands, and we think that this Transmission Twist is the very best, Mr. Bell—"

"Listen, brother," said Mr. Tell, tapping the speaker impressively on the knee. "See that sad relic of manly beauty on the floor out in the hall? Well, that's what I do with 'em and that's where I lay 'em when they take up my time talking about bells and other foolishness including tobacco. Please don't slam the door as you go out, I'm sort of nervous today."

Mr. Naggle departed, all except his head which remained in the door. "In case of any difficulty," he ventured, "you would have the services of our engineering department—" then he entered into a speed contest with a heavy ink well that buzzed hopefully behind his ear for half a block, but finally gave it up and fell into a mud puddle.

Zach started for the cloth room the third time, and the super picked up the production report again. Over the top of the paper a shiny object caught his eye and he looked up at a celuloid collar surmounted by a wide grin and a tangle of red hair. "Huddoo," said the latest intruder extending a grime encrusted fist. "You do the buying?"

Mr. Tell reached for his paperweight, but had a better idea. "No, sir," he said. "Not today, anyway. You go up stairs, and you'll find a nice old man who thinks he owns this mill. He's the president, and I know you'll like him." He folded up the production report. "Just walk right up and tell him what you want to sell, and while you're at it hand him this paper as a favor to me. He'll give you an order, I know he will."

"I'm sure glad to hear it," said the red head. "Business is on the bum for fair. I'm an inventor myself, but I work in auto garages when the inventing business gets poor. I'm working on something new I thought up, and it's a humdinger. It's an exter cylinder to put on a car so as to make it work better. You know how all these cheap cars ain't got but four cylinders, and three of them is all will generally run. Well, I'm selling a fifth cylinder you kin attach in ten minutes so you kin let one be dead all the time and still have your four right on.

"Ain't that a good idea? Say, the company can buy them and let the help have them at cost. Then everybody kin be here on time in the morning. Increase your efficiency twenty per cent. If you have any trouble, I gotta engineering department will help you out."

"Fine," said Mr. Tell. "Just walk right up and tell the man up stairs, and don't forget the paper."

"Sure," said the inventor trudging hopefully up the steps. "I'll knock him for a row of orders, I betcha." Mr. Tell retreated to the back door and listened anxiously for half a minute. Then he heard a fearful howl and the sound of scuffling feet, succeeded quickly by sickening thumps on the floor above. Mr. Blamlam, the bell salesman, grunted and sat up, reaching around for his set of chimes. The paymaster in the front office gathered up his payrolls and pencils and shut himself up in the safe. More yells and the sound of flying feet materialized into the red headed inventor charging down the steps at top voice and speed, pursued by a fierce little old man with the production report clutched in one hand. He streaked down the hall, picking up Mr. Blamlam in his wake as a moving train picks up bits of paper on the track, and the two of them departed with that curiously sudden increase and diminution of sound characteristic of the rapid passing of automobile horns or locomotive whistles; an effect that was, in Mr. Tell's case at least, accentuated by his own flight in the opposite direction.

By the cloth room door he met Zach coming back. "Don't go there," he said jerking his head toward the office. "He's got 'em bad this time. It must be terrible to have such a temper, but it's good for something after all. I put it to work just now getting rid of a drummer. I hate to be downright cruel, but something's got to be done so a man can do

his work. Here I've lost half a day over nothing. They come around all times of the day and sometimes they come to my house at night trying to sell me all kinds of fool things, and they act as if they think I have more time than Methuselah. I sure fixed that last one. I sent him upstairs with the production report. He was a right nice boy, too, but I knew the president would foam at the mouth when he saw that report, and somebody had to be the goat.

"He put that poor boy through a course of sprouts that will cure him of selling extra auto cylinders for a long time. I'm sorry I lost my temper, though. We all have to make a living somehow, and that reminds me. I'm going to quit this darn business and start a chicken farm. I've got some high class eggs in a bucket under the office. I paid a dollar apiece for them. I'm going to talk to a man tonight about buying a good piece of land to raise some fancy chicks on, and I want my pants pressed good. Did you do it?"

Zach clucked, snapped his fingers and departed officeward at a run. The cloth room boss appeared with a corrected report of the production and seconds and apologies for the errors in the first one. Mr. Tell glanced over it. and a happy smile spread over his face as he hastened to the president.

"Yes, sir," said that worthy as he glanced over it. "I'll agree with you that this is some better, Mr. Tell. In fact it is the best showing we have made in a long time. I congratulate you. I sort of lost my temper when that flip young man brought up the other one, but I'm sorry I was so hasty. I'm very glad you weren't here in person, Watt my boy. The consequences might have been distressing."

"Oh, that's all right," said Mr. Tell. "I know you are hot tempered. Some folks can't help being that way. Now me, I never get riled."

A queer burned smell heralded the approach of the office boy bearing on the end of a stick an almost red hot tin bucket. "Hyuh's de bucket uv aiggs" he explained. "I sot de iron on hit, not knowin', an' hit het up turrible whilst I wuz gone. De top ones fried and de bottom ones hatched out. De heat musta made de hatched ones hongry, cause dey et up de fried ones—"

Mr. Tell let out a howl of wrath, but the president caught his arm. "Don't lose your temper," he said. "These little annoying things which come up in our daily life are provoking sometimes, but if you develop a proper philosophy of life, Watt my boy, you will not be troubled by them. Zach shouldn't be blamed. His act was unintentional."

"Yassuh," agreed Zach. "Be cam. Hyuh come another drummer."

He came as Zach went. He commented on the weather, the election, the national debt, six murder cases and the queer ways of the younger generation. He quoted poetry, sang two songs and gave a gymnastic exhibition. Mr. Tell's face got red and the president's mustache began to curl up at the corners. Finally when they asked what he was selling, he reached for his sample case.

"Left-handed monkey wrenches," he said. "New invention. Increase your efficiency twenty per cent. Engineering research department at your service."

The president and Mr. Tell reached for two chairs and raised them high. Then their eyes met, they hesitated, laughed and put them down. "What's the use?" said the president. "Give him an order for a dozen."

Towels and Toweling

BY T. WOODHOUSE AND A. BRAND.

Spot Designs. One of the simplest forms of embellishment for textile fabrics, and one which finds many applications in all types of woven textures is the production of more or less elaborate spot effects; these effects may be obtained either by means of color or by change of weave, and occasionally by both methods in combination. So far as towels and toweling are concerned, the methods requiring colored threads for embellishment in spot form are seldom if ever used, but the method involving the production of spot effects by change of weave is common enough.

The basis of distribution of the spots forms quite an interesting study in itself, but in these articles it is not intended to introduce matters pertaining as much to mathematics as to textile design. Suffice it to say that the bases of distribution are sometimes simple and sometimes more or less complex, and that the spots themselves may be produced by simple floats of warp or of filling, by both, or by much more elaborate weave effects. Generally speaking, it is not necessarily the most elaborate weave effects and arrangement which give the best results in the woven texture. Indeed, so far as towels are concerned, simplicity must be the keynote of the design, as it is essential to produce a firmly-woven fabric with a good amount of interlacing, and, to keep down production expenses, a comparatively small number of harnesses should be employed.

It is essential, of course, that the basis of distribution should be primarily fixed and adhered to rigidly. When the spots are simple, the geometric nature of the basis is sometimes unintentionally emphasized, but in the more elaborate forms, designs often take great pains to obscure the basis. Plain weave is a common basis for distribution in designs intended for towel fabrics where the ornament is simple in character, but when more elaborate forms are used, such as necessitate the use of the jacquard loom for their production in cloth, the 4-thread and 6-thread broken or irregular sateen weaves are often used with satisfaction as distribution bases.

When color effects are not used, the ornament in textile fabrics depends almost wholly on contrast in weave effect; hence, the ground weave of fabrics intended to be embellished by spot designs is generally of plain weave or at least a weave of simple character. The spot itself is then developed by longer floats of either warp or filling (occasionally by both) so that it will stand out prominently from the ground of the fabric. By reason of the necessity for using comparatively long floats—except where damask effects are required—spot designs have a comparatively limited application to towels and toweling. The reason for this is the fact that the spot effects tend to introduce looseness of structure—a serious fault in a towel fabric. Nevertheless, they are occasionally introduced into such fabrics.

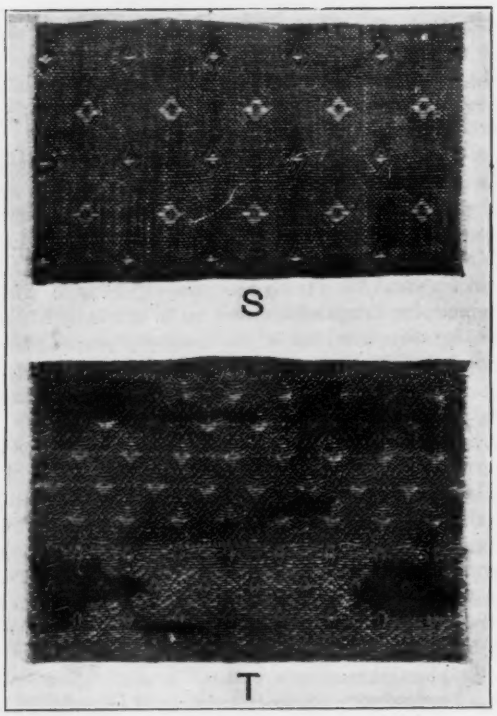


FIG. 85.

Two typical examples of these spot designs, at least one of which is well suited for towels and toweling, are reproduced photographically at S and T in Fig. 85. Both these simple fabrics were originally woven for pattern purposes in the same loom with the same 2-fold mercerized green cotton warp. The upper sample S exhibits a series of spots arranged in plain weave or diamond drop order. The spots are of two different kinds, and both are diamond-shaped. One spot is composed mainly of filling, while the other is developed mostly by warp. Since, in this particular case, the warp spot is the exact reverse of the filling spot,

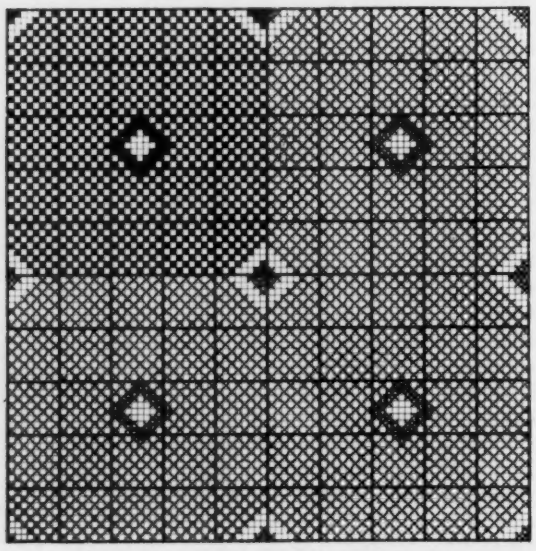


FIG. 86.

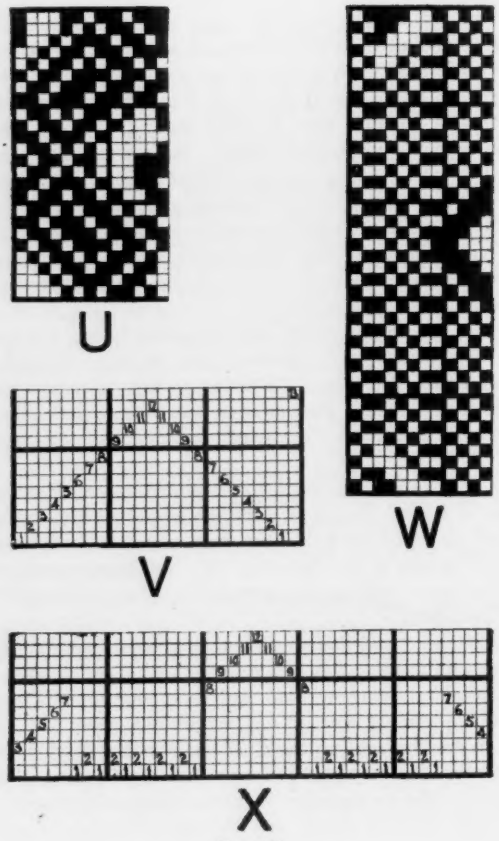


FIG. 87.

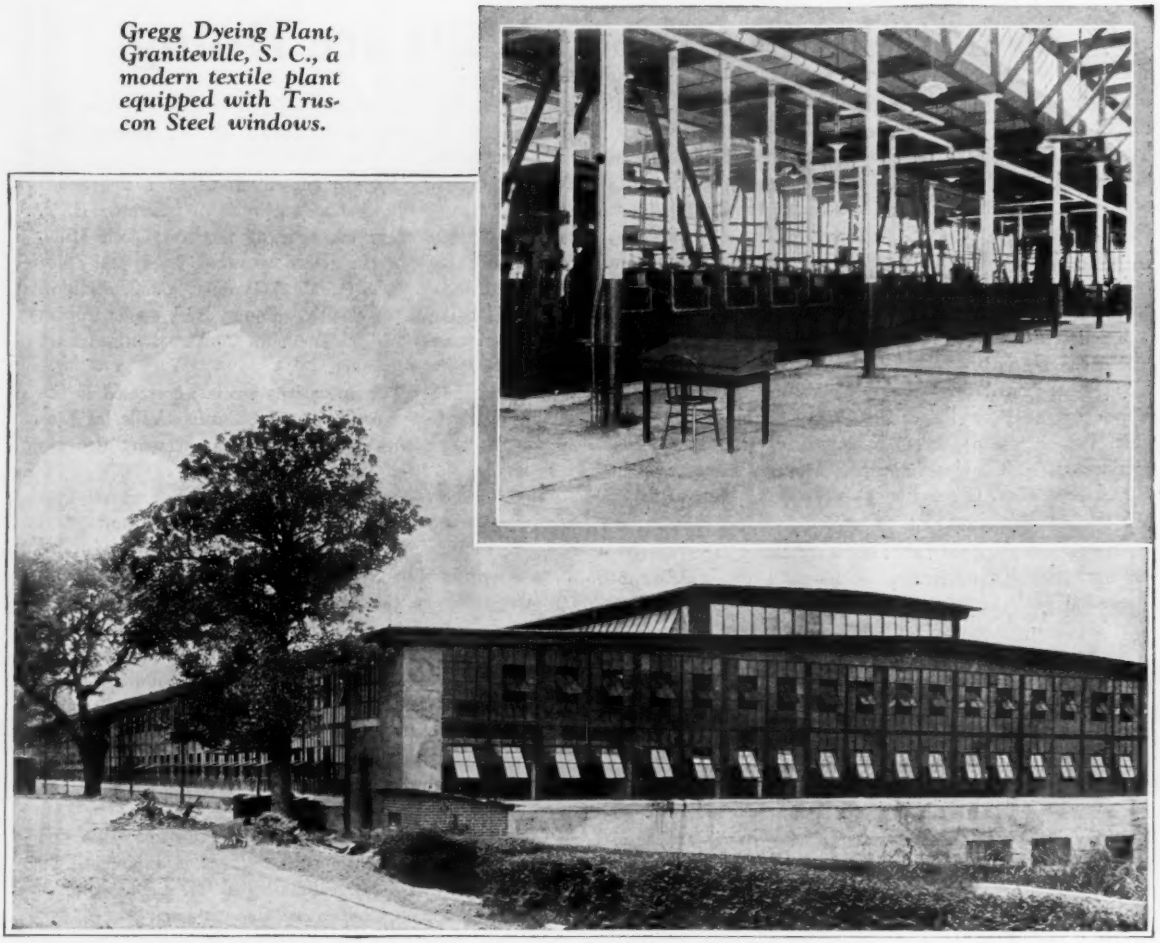
the fabric presents the same appearance on both upper and lower surfaces. The sole difference is that when a warp spot appears on one side of the cloth, a filling spot is found in the corresponding position on the other side, and vice versa. The ground weave is plain, giving relative firmness of structure, and hence the fabric is eminently suited for certain classes of toweling.

In the lower example T, Fig. 85, the characteristic spot is produced by floats of filling arranged to produce a modified form of diamond. The ground weave itself is composed of a series of diamond and lozenge-shaped figures arranged symmetrically about the central spot. Owing to the relatively small length of the floats, and to the similarity in length of warp and filling floats in the ground weave, these diamond and lozenge-shaped figures are not well defined in the fabric. This, however, is not altogether a fault, as the ground weave exhibits a certain degree of matt or all-over effect, and thus affords a sufficient amount of contrast to the figuring spot. The opposite side of this fabric as shown by the small turned-over portion at the bottom of sample T, Fig. 85, naturally shows warp spots, and this side of the fabric, on the whole, is less effective than the first-mentioned side.

Particulars of the point-paper designs for the fabrics in Fig. 85 appear in Figs. 86, 87 and 88. Four repeats or units of the weave for fabric S in Fig. 85, appear in Fig. 86. The unit design in solid black squares is complete on 40 threads and 40 picks, but, despite the comparatively large number of threads to the repeat, the design can be

(*Continued on page* 505.)

Gregg Dyeing Plant, Graniteville, S. C., a modern textile plant equipped with Truscon Steel windows.



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TRUSCON STEEL WINDOWS

What the Southern Mills are Doing

The southern section of the American Society of Textile Chemists and Colorists, organized during the Southern Textile Exposition at Greenville last Fall, held its first meeting in Charlotte, N. C., a short time ago, in the form of a dinner at the Southern Manufacturers' Club. About 50 members were present. Brown Mahon, of Greenville, S. C., presided over the session as chairman of the southern section. Charles H. Stone and Charles P. Walker, of the Grasselli Chemical Co., read two interesting papers, which was followed by a technical discussion of various dyestuff and chemical work.

Officers elected for the ensuing six months are: H. M. Chase, of the Riverside & Dan River Cotton Mills, Danville, Va., chairman; Malcomb McKenzie, Cramerton Mills, Cramerton, N. C., vice-chairman. Harry Ormond, of the Union Bleachery, Greenville, was re-elected secretary.

* * *

An item of especial interest during the past month was the announcement by Russell H. Leonard, treasurer of the Pepperell Manufacturing Company, of Biddeford, Maine, that this company will construct a new unit at Opelika, Ala., removing to the southern branch the necessary machinery from the Biddeford plant to equip a mill of 20,000 spindles and 600 looms. At the time of the announcement options on several sites in Opelika were held, but no particular location selected.

Improvements being made at the Langdale (Ala.) mill of the West Point Manufacturing Company include the installation of a humidifying system by the American Moistening Company, it is announced. The Dwight Manufacturing Co., at Alabama City, Ala., also are installing one of these systems.

Work on about fifty new houses for operatives has been completed by the Alexander City Cotton Mills, Alexander City, Ala., as well as the construction of a school building to replace the structure destroyed by fire several months ago.

A new humidifier system is being installed at the Merrimack Manufacturing Company, Huntsville, Ala., by Parks-Cramer Company, of Charlotte, N. C.

A mill deal involving approximately $600,000 was consummated at Dalton, Ga., recently when the Crown Cotton Mills of that city acquired the control of the Elk Cotton Mills also of Dalton. The Elk mill now produces yarns only, and it is not known whether weaving equipment will be added, although it is reported that considerable enlargement and improvement work will be undertaken by the new owners.

Continued report states that the Appleton Mills, of Lowell, Mass., which for some time have held options on two tracts of land near Gainesville. Ga., with the view to establishing a southern mill there, have definitely contracted for one of the locations, and will institute plans for the construction of a plant and village. This report was not verified by officials of the company.

An addition of 160 40-inch and 64-inch Draper looms is being made at the Dixie Cotton Mills, LaGrange, Ga., the new equipment to be driven by individual motors. Robert & Co., Atlanta, Ga., are the engineers.

Unity Cotton Mills, LaGrange, Ga., are constructing an opener room and building an addition to the mill, and machinery will be re-arranged. Robert & Co., Atlanta, Ga., are the engineers.

In North Carolina, the announcement of a fine goods weaving mill to be erected at Shelby is of interest. E. T. Switzer, until recently manager of the Art Cloth Mills, Lowell, N. C., will be the active operating head, and other men interested include O. Max Gardner, C. C. Blanton and O. M. Mull, all of Shelby. Fancy dress goods fabrics will be produced, it is understood. Construction work on the plant will begin at once.

Ten new houses for operatives are being erected in the village of the Boger & Crawford Spinning Mills, at Lincolnton, N. C., where other village improvements also are being made.

The Cocker continuous system for dyeing warps with sulphur colors is being installed at the E. M. Holt Plaid Mills, Burlington, N. C. The Art Cloth Mills, Lowell, N. C., is installing three Cocker improved section beam warpers equipped with the new type direct pull electric stop creel.

George C. Bell, mill architect and engineer, who recently opened an office at 420 Piedmont Building, Charlotte, N. C., is in charge of the addition at the Corriher Mills, Landis, N. C., in the form of a picker building, and other additional floor space for the addition of 11,000 spindles. Electric power plant will be installed, it is understood.

Construction work on the Jonesboro Cotton Mills Co., Jonesboro, Arkansas, will begin soon, it is announced by G. F. Roberts, who is general manager. H. J. Bosler, mayor of Jonesboro, is president of the concern.

Work of renovating and repairing the former Hamilton-Carharrt mill at Mobile, Ala., has been completed, with new machinery installed in the plant. Operations have begun, it is announced by J. W. Sanders, manager.

The addition of the Dixie Mercerizing Company, at Chattanooga, Tenn., will consist of a concrete, one-story structure, 105 x 108 feet, to cost approximately $30,000. This building will be used for additional spindles, it is understood.

Standard-Coosa-Thatcher Company have made appropriations for extending and improving the plants at Chattanooga, Tenn., and Piedmont, Ala. The most important part of the work will be the enlargement of the mercerizing plant at Chattanooga at a cost of approximately $150,000, it is stated.

Three of the largest textile manufacturing plants in Texas were merged into one corporation last month when the C. R. Miller Manufacturing Company, which operates the Miller Cotton Mills at Waco, purchased the Texas Cotton Mills at McKinney, and the Dallas Textile Mills, at Love Field, Dallas. The company has increased its capital stock to $6,000,000 to provide for this expansion. It is definitely understood since the merger that a new mill to manufacture towels, etc., as well as a finishing plant, will be erected at the location of one of the plants. C. R. Miller, of Dallas, is president; W. C. Stripling, of Fort Worth, and Hugh S. Clarke, of Waco, are vice-presidents, and F. E. MacCurdy, of Waco, is secretary and treasurer.

The fluidity of fixed assets

Property is customarily regarded as a "fixed asset." It is so classified in the balance sheet; but its permanence is only relative, and its changes are of primary importance to management, to stockholders, and to investors.

Wear and tear, obsolescence, and inadequacy are incessantly carrying away property dollars that must eventually be replaced.

The extent of the resulting change in the so-called permanent assets affects profit and loss, credit status, and the amount recoverable from fire insurance companies.

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The two mills just acquired were formerly controlled by J. Perry Burrus, of Dallas.

Contract for the construction of a three-story addition to the Valley Falls plant of the Martel Mills, Inc., at Spartanburg, S. C., has been let to the Fiske-Carter Construction Company, of Greenville. The addition will be 200 x 100 feet, and will cost approximately $100,000.

Eureka Cotton Mill, Chester, S. C., has awarded contract for the erection of 25 new houses for employees, in addition to the half hundred recently completed.

The capacity of the Greenville, S. C., plant of the Lullwater Manufacturing Company will be doubled by the addition of 5,000 spindles and complementary looms, it is reported.

Plans for doubling the capacity of the Addison Mills, at Edgefield, S. C., are under contemplation by the owners, the Kendall Mills, Inc., 60 Congress St., Boston, Mass., according to report.

The New England Mill Situation.

New England cotton mills are gradually but slowly working out of the severe depression brought on primarily by high cotton. The price of cotton has been steady on a level not far from 25 cents a pound and it has been found possible to merchandise goods moderately on that basis. It is by no means yet established that the full production of the country's cotton mills can be taken care of on that level, but the curtailment of last year is being felt, and the general purchasing conditions of the country have not undergone any very striking change as yet.

It is manifest to far seeing merchants in this section that the cotton mills are facing new and difficult problems arising from the attitude of retailers, and the vogue of silks and woolens. The advent of rayon as a factor in the problem is of great importance as that material seems to rest upon cotton as one of its most important props. The manufacturers of rayon say that the whole product is but one per cent of the output of cotton, nevertheless, that little suffices to make the merchandising of some cotton goods most uncertain. The cotton mills are using larger quantities of rayon than ever before and dress fabrics made in cotton mills, and other fabrics usually made in those mills show the growing influence of the new fiber. This is notably true of bedspreads, ladies' underwear, and upholstery fabrics.

One very important matter in conjunction with cotton goods has come to the front in the past few months and the New England mills are likely to benefit greatly from it, especially in the finer yarns. Color fastness, secured through the aid of American dyes, is one of the best selling arguments in the markets at the present time. The laundries have worked havoc with cotton goods for a long time because of fugitive colors but that stage appears now to be passing. Colors in cotton goods offered this year are really fast and consumers are beginning to learn of the fact.

It is particularly noticeable in printed goods and in piece dyes on fine combed yarn cloths where frequent washing is necessary. It has been true for a long time that the heavier goods have been well dyed as a rule, such cloths as the indigo denims, the khakis, and many of the chambrays and ginghams, being reasonably fast. But the markets have been flooded with other goods that have been unsatisfactory to the consumers and this defect is being notably lessened. The spring fabrics are so colorful this year that fastness to ordinary influences of sun, fog, or rain, would be insufficient to make them widely popular. The new dyes and the manner of applying them in the larger print works and finishing plants make it reasonably certain that even the laundrymen cannot kill cottons unless they deliberately set out to do so.

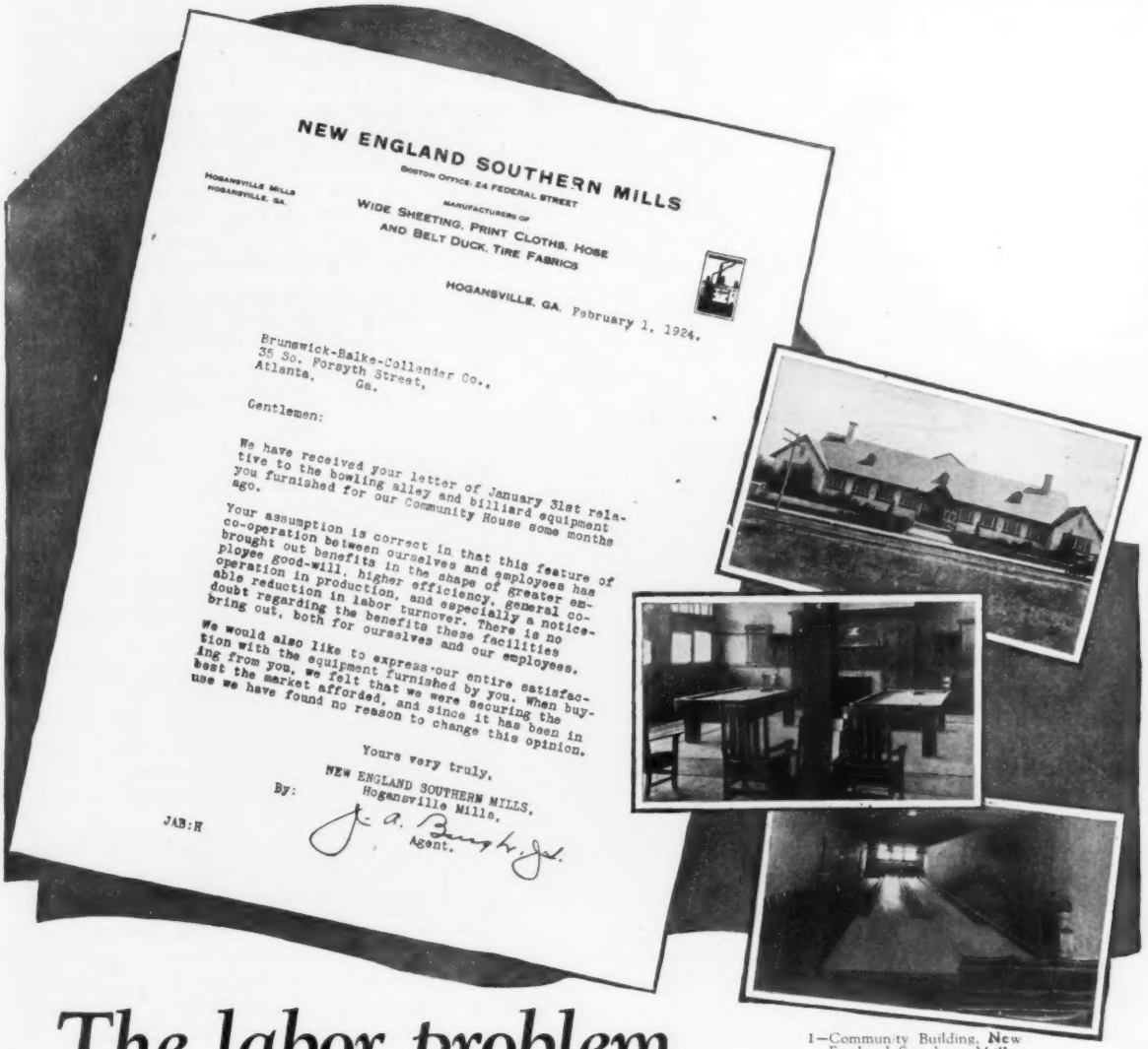
The opinion is held by a number of New England men that this new color guarantee is going to assist with a lower price in restoring some part of the popularity cottons have lost in the past few years. In any event, the large printers of New England, and the best known large dyers of fine wash fabrics, are as busy as they can be, and they are hopeful of a fair season as the spring styles get to the counters and into consumers' hands. The job finishers are not doing as well as the large corporation printers and finishers for the reason that prices have been on very close profit margins, and the larger concerns have not striven for profits so much as they have to restore normal production.

While production in New England is not yet as far restored as it is in the South as a whole, yet the gains of the past two months haye been larger than the gains in the South. In other words, New England mills are beginning to get more business and are able to compete more satisfactorily than they were three months ago. This has been helped to a large extent by the reductions in wages, but it has been helped quite as much by the wider adoption of economies in operations than it was possible to bring about previous to this winter.

The sorest spots in New England have been in Rhode Island and Fall River. In Rhode Island, the Knight mills are getting back into running order, about one-half of the installed spindles and looms now being active. In Fall River, production has reached to about 55 per cent of capacity in the print cloth yarn mills, or perhaps about 65 per cent in all the mills, taken together. While Fall River is constantly referred to as "a print cloth city," it is to be remembered that approximately a fourth of the spindles there work on yarns above 40s which is out of the print cloth class.

In Maine, the mills are now operating well up to 80 per cent. In New Hampshire, the operations are well over 80 per cent. In Massachusetts, as a whole, the production does not run over 75 to 80 per cent. In Connecticut it closely approximates normal. Short hour legislation is under discussion in New Hampshire and it has not been dropped in Rhode Island. Should either of those states adopt a 48 hour law it is stated by manufacturers that it may be some years before the mills will be able to operate more than 80 per cent, even on that restricted basis. The line that marks losses and profits is drawn very close.

During the past six weeks, or since the turn of the year, there have been a great many financial reports published showing the earnings or lack of earnings in New England mills, and they have served to give a wrong impression of the immediate manufacturing situation. The conditions that brought about the huge losses of last year began to change in October, in a positive way, so that the last six months of the fiscal year of some of the mills began to show definite improvement. But the gains were not large enough



NEW ENGLAND SOUTHERN MILLS

BOSTON OFFICE: 24 FEDERAL STREET

HOGANSVILLE MILLS
HOGANSVILLE, GA.

MANUFACTURERS OF
WIDE SHEETING, PRINT CLOTHS, HOSE
AND BELT DUCK, TIRE FABRICS

HOGANSVILLE, GA. February 1, 1924.

Brunswick-Balke-Collender Co.,
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Gentlemen:

We have received your letter of January 31st relative to the bowling alley and billiard equipment you furnished for our Community House some months ago.

Your assumption is correct in that this feature of co-operation between ourselves and employees has brought out benefits in the shape of greater employee good-will, higher efficiency, general co-operation in production, and especially a noticeable reduction in labor turnover. There is no doubt regarding the benefits these facilities bring out, both for ourselves and our employees.

We would also like to express our entire satisfaction with the equipment furnished by you. When buying from you, we felt that we were securing the best the market afforded, and since it has been in use we have found no reason to change this opinion.

Yours very truly,
NEW ENGLAND SOUTHERN MILLS,
By: Hogansville Mills,
Agent.

JAB:H

1—Community Building, New England Southern Mills, Hogansville, Ga.

2—A corner of the billiard room in this building, and

3—The bowling equipment.

The labor problem

TO AVOID every form of labor difficulty; to keep workers from becoming restless; to keep them happy, contented and loyal are factors of management that constitute a knotty problem in industrial centers.

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to offset previous losses so that the reports submitted to stockholders at their meetings in the past few weeks have been decidedly discouraging. If they were submitted without some evidence of better conditions being actually in sight, it is hard to say what the feeling in New England might be at this time.

As an instance of how things stand, the quarterly report of dividends paid by Fall River mills showed disbursements of an average of 1.44 per cent for 37 corporations capitalized at $44,465,000. This sum was enhanced by a payment of $225,000 to stockholders of the Tecumseh mills, as a payment from the sale of the properties to the Davol mills, some time ago. There were 19 out of the 37 corporations that paid no dividends and three cut their dividends compared with the previous quarter. There are half a dozen mills wholly idle and have been so for several months.

Outside of Fall River some very depressing financial reports were issued to stockholders by mills that are not only very well equipped but are very well managed. These mills are now getting into running shape again and are earning some money. Nevertheless, the fact that so many of these losses have appeared has had something to do with killing the optimism that was noticeable when the year opened.

There are still a few mills that are having troubles growing out of wage reductions but on the whole there is little disposition shown to encourage the agitators of the Federation of Labor who are still active in some parts of the New England field.

One of the singular facts of the New England situation is that some mills are running overtime trying to make deliveries to buyers who delayed placing business for spring until it was too late to get out the goods when wanted. Side by side with some of these mills there are others that are not running to more than half capacity, or are completely idle. It is possible to explain some of these things by pointing out the slow trade on brown sheetings at a time when certain of the wide print cloth numbers command premiums for spot delivery. The goods that are not in stock are beginning to show a profit, but wherever stocks exist, the buyers appear to hold off and dominate the market. The gains come slowly and irregularly.

Percales have been advanced ¾ cent a yard in the past month on good sales. A great many dress prints in bright colors are being made by the large printers and they are in active demand. Then there is a great call for broadcloths, sateens, and silk and cottons for spring, many of the goods being dyed or printed in very high colors.

The gingham situation is also improving. The Amoskeag Company is now running more machinery than at any time in over a year, while some of the other large gingham mills are gradually finding a market for their new lines. Some of the mills making fancy dress ginghams cannot undertake new deliveries before April owing to the inability to get warps into shape before then. Moreover, the mills prefer to go into the new fall gingham season with a minimum of stocks. The buyers are gradually finding that the gingham mills have not accumulated stocks in advance of orders, so that it is becoming possible to hold firm for better prices that are sure to come when the new season opens in March.

Bleached cottons have been steady and the larger bleacheries are quite well employed. Fruit of the Loom 4-4 goods are sold ahead into May, Hope muslins are sold ahead into April, and some other well known brands are now well conditioned on orders for the early spring at least. The mills making the well known brands of sheets and pillow cases are running in full and selling what they are making. Less well known brands are not doing quite so well.

The napped goods season for 1925 developed more business than was seen in other divisions where lines were offered for late delivery. There are some of the mills making goods of this sort that have all the business they want up to July. Madras and fine cocoon silk mixed shirtings are doing better. Bedspread mills are active on rayon mixtures. Fancy towel mills are more active. Fine combed goods are in better shape than at any time in two years. On the whole the New England mill situation could be very much worse at this period of recovery from the most severe depression in years.

Cotton Comment.

BY H. AND B. BEER.

New Orleans, February 14th, 1925.

Compared with one month ago, the cotton market is about one cent, or about $5 per bale higher.

The higher prices, in the face of the larger supply this season, the result of last year's large crop, being due to the continuance of a good foreign and domestic demand, and the continuance of the drouth in the Southwest, especially in Texas where plowing for the next crop is retarded because of dry soil in the central and western portions of the State.

Late official returns from England, and U. S. Census Bureau returns for this country, denote gratifying progress in the textile situation on both sides of the Atlantic.

BRITISH BOARD OF TRADE REPORT FOR JANUARY.

	This Year	Last Year
Exports of yarn, lbs.	16,000,000	11,000,000
Exports of cloth, yds.	403,000,000	354,000,000

U. S. CENSUS BUREAU REPORT FOR JANUARY.

UNITED STATES	This Season	Last Season
Jan. consump'n. inc. linters	641,525	619,057
For 6 months, including linters	3,237,614	3,383,736
Mill stocks, Jan. 31	1,433,814	1,637,824
Stocks in public storage. Jan. 31	3,863,475	2,963,983
ToTtal stock U. S. Jan. 31	5,297,289	4,601,807
Active spindles Jan. 31	33,180,758	33,279,926

The available supply of American raw cotton remains large, however, notwithstanding spinners of the world having taken already this season 8,683,000 bales, against 7,369,000 to even date last season, as noted by the following deductions:

February 13th	This Year	Last Year
World's visible supply of American	4,393,000	2,817,000
Unmarketed, estimated	2,458,000	1,821,000
World's supply of American available	6,851,000	4,638,000

But the world's visible supply of foreign cotton today is only 1,196,000 bales vs. 1,630,000 last year.

EXPORTS FROM THE UNITED STATES.

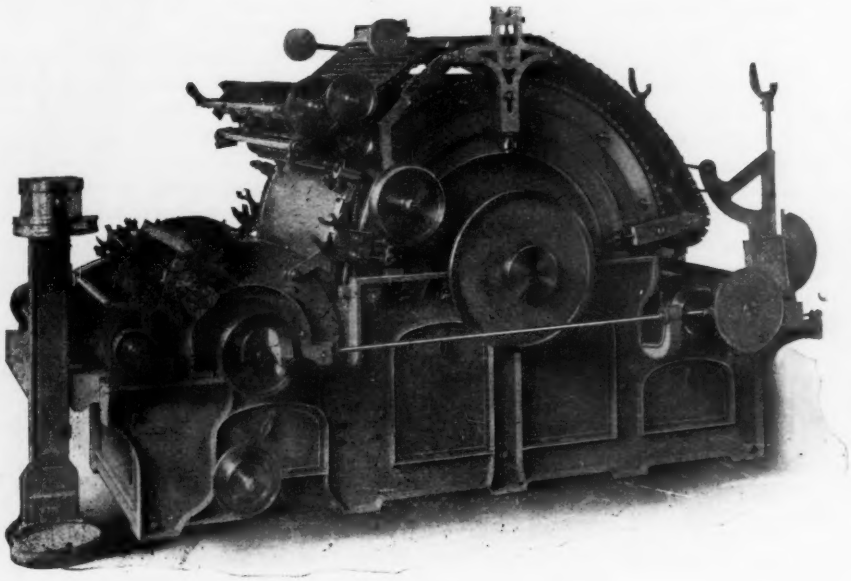
	This Year	Last Year
From Aug. 1/24 to Feb. 13/25	5,678,000	3,991,000

H. & B. AMERICAN MACHINE CO.

Pawtucket, R. I.

Southern Office, 815 Atlanta Trust Co. Building, Atlanta, Ga.

COTTON MILL MACHINERY



Revolving Flat Card

OUR Cards are extensively used, and have won for themselves a high reputation for the quality and quantity of work they will do, the small percentage of waste made and their durability and simplicity.

Amongst the many features and points of special merit embodied in the machines which it would pay you to investigate are:

The Rigid Bend, mathematically correct at all stages of wear of the wire.

Perfect concentricity of Flats to Cylinder.

Arrangement for adjusting Flats whereby accuracy to the thousandth of an inch is obtained.

Adjustable Cylinder Pedestals and Bearings.

Special bulletin sent on request.

Exports from U. S. after Feb. 13....	(?)	1,667,000
Total for whole season	(?)	6,658,000

Shipments from the United States are already larger than they were for the whole of last season, with 5½ months to spare, making it probable for exports for the whole of this season to amount to 7,500,000, perhaps 8,000,000 bales vs. 5,658,000 last season and 4,643,000 for whole of season before last, which shows how eager Europe is for raw cotton this season.

There is more than one reason for the urgent demand from abroad. In fact there are several causes for the continuance of the demand. Owing to reserves abroad having been almost depleted last season, due to the previous three consecutive short crops, Europe was in need of much cotton for this season's requirements, and as the American supply was larger, and selling at a relatively cheaper price than foreign cotton, European mills took largely of the American product this season.

Another feature of the situation is that foreign spinners are uneasy as regards the outlook for this year's crop owing to the great deficiency in the winter rainfall in the Southwest, and are evidently buying for future requirements, at present prices, rather than risk the possibility of a short crop this year, as last year's crop was the first good yield in four years, or since 1920, due to weevil in the east and drouth in the west.

There is cause for apprehension as to the outlook for the next crop, especially in Oklahoma and Texas, because of lack of moisture in the ground.

Rainfall for 6 mo. ending Jan. 31st, inches	This Season	Last Season	Normal
Texas	7.45	19.68	11.81
Oklahoma	7.78	22.24	9.89

So far this month there has been very little rainfall in Texas, whereas during February of last year it was 2.53 inches.

Human Relationships in Industry.

(*Continued from page* 458.)

for flaws in materials and remedies applied in removing same?

6. Do you keep a record of amount on hand, amount passed through, amount in process?

7. What record have you of supplies, purchase, and distribution?

8. What records that you do not have now, do you think will be of value to you?

It is not necessary for the writer to proceed further with suggestive questions. The case has been orientated sufficiently for the leader to proceed with the conference taking up the various subjects indicated in the earlier part of this chapter.

If this conference results in a decision by the group that no further records or reports are needed, that the records and reports now being used are entirely satisfactory and sufficient, if this decision has been reached after a free, frank and openminded discussion, this conference will have been worth while.

If the group decides that other records and reports are necessary and of value in the daily discharge of their duties and the forms and kinds of such records and reports are decided upon, the conference will have been worth while. In the first case it does any group of business people good for them to take a little time off now and then and thoroughly take stock of any phase of their business. If they have certain general ideas which they think are true, but require verification, it is good for them to be verified so that these people can proceed with assurance of definite information and facts.

In the second place, it enables the group to find their weaknesses, so that they may correct them, and be able to proceed with the feeling that they know where they are at all times.

Another value is that of making the mind alert and watchful, properly appreciative of the records and reports required. It gives the group a rather detailed insight into many of the supervisory, managerial and instructional duties of an overseer.

In conclusion, it should be added that this conference, as all others, was not intended to be complete, but to be suggestive, so that the leader of the particular group may adapt it to his own particular needs and desires.

A useful booklet relating to their novelty twister has been issued by Fales & Jenks Machine Co., Pawtucket, R. I. A description and illustrations of this machine for the production of novelty and fancy yarns are included, and other sections show illustrations of samples of spiral and rocker nub yarn, intermittent nub yarn, loop yarn, and splash yarn, with full directions for setting the machine to produce each. Their standard analysis and record blanks, for recording details of novelty yarns in analyzing samples and placing the information on record are also shown.

The Cotton Manufacturers Association of Georgia will hold their annual meeting at the Biltmore Hotel, Atlanta, Ga., on Tuesday, May 12th, it is announced. This meeting will be in the nature of a 25th anniversary of the organization's existence, and several surprising and unique features are planned, according to the announcement.

EDWARD SCHECK is the resident manager of the plant of the Wallace Wilson Hosiery Co., recently established at Salisbury, N. C.

JOHN F. SCOTT, manager of the Edna Cotton Mills, Reidsville, N. C., now is also manager of the Henrietta Mills at Henrietta and Caroleen, N. C., succeeding T. B. Stevenson, resigned.

E. S. WARD has been promoted to superintendent of the Pomona Mills, Greensboro, N. C., succeeding L. H. Thomas, resigned.

GEORGE C. BELL, mill architect and engineer, has opened an office in the Piedmont Building, Charlotte, N. C.

RALPH T. LEGRAND, who for 12 years has been superintendent of the Shelby Cotton Mills, Shelby, N. C., recently was made secretary-treasurer of the company to succeed the late J. C. Smith.

Woodward Wight Company, well known mill supply dealers, New Orleans, Louisiana, have created a new department to handle building material, and J. W. Townsend is in charge. Truscon materials, produced by the Truscon Steel Co., of Youngstown, Ohio, are being used as the leading line, it is stated.

SACO-LOWELL

LARGEST MANUFACTURERS OF TEXTILE MACHINERY IN AMERICA

SACO-LOWELL SHOPS
TEXTILE MACHINERY
CHARLOTTE, N.C.

March 1, 1925

TO THOSE WHO OPERATE AN OLD MILL:

BUDGET YOUR IMPROVEMENTS FOR
THE COMING YEARS

Gentlemen:-

Use our service organization. Let one of our practical mill men, along with our service men and sales engineers, go over your plant from the Opening Room to the Slasher Room. Then, let them give you sound practical advice as to how you can gradually modernize your plant. Let them list proposed improvements in the order of their importance. Do not let your plant simply collapse in one year for the lack of careful surveys and carefully planned budget systems for improvements. Make a plan and work to it. Deviate only when business conditions warrant certain changes.

This service is free for the asking.

Yours very truly,

SACO-LOWELL SHOPS

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1824 SALES OFFICES 1925

No. 1 Federal St.	1220 Mint St.	Masonic Building
BOSTON, MASS.	CHARLOTTE, N. C.	GREENVILLE, S. C.

NOTES ABOUT MEN YOU KNOW OR KNOW ABOUT

WILLIAM HENRY WELLINGTON, senior member of the firm of Wellington, Sears & Co., who hold extensive interests in textile industries over the country, died recently at his Boston home at the age of 75 years. Among his textile connections in the South were the following: chairman, board of directors, West Point Manufacturing Company; director, Brookside Mills; director, Columbus Mfg. Co.; director, Dixie Cotton Mills; president, Equinox and Gluck Mills; director, Lanett Bleachery & Dye Works; president, Samoset Cotton Mills, vice-president, Sherman Mfg. Company; director, Anchor Duck Mills.

L. H. BECK, who recently resigned as general superintendent at the Hart Cotton Mills and Fountain Inn Mills, Tarboro, N. C., has accepted a position with the Fitzgerald (Ga.) Cotton Mills, the Cochran (Ga.) Cotton Mills, and the Henry Cotton Mills, Hawkinsville, Ga., which are all under the same management. Mr. Beck will have direct charge of the Cochran mills at Cochran, and will act as assistant to J. H. Mayes, the treasurer and manager.

S. M. ESSENDEN has been appointed general manager of the new plant of the Sayles Finishing Company, to be erected on the Swannanoa river about three miles from Asheville, at Swannanoa, N. C.

GEORGE H. LEITNER, general superintendent of the plants of the Graniteville Mfg. Company, at Graniteville, Warrenville and Vaucluse, S. C., has been made vice-president of the company.

L. H. RICE, formerly overseer of weaving at the Manchester (Ga.) Cotton Mills, has been made assistant superintendent under General Superintendent W. W. Arnold, Jr. G. W. Wheelis has been promoted to overseer of weaving succeeding Mr. Rice.

B. J. BODDIE is overseer of weaving at the Lullwater Mfg. Company, Greenville, S. C., instead of M. J. Benton, as was erroneously stated on this page in the January issue.

J. C. SCOTT, formerly division superintendent of carding and spinning at the Manville-Jenckes plant, Gastonia, N. C., has accepted a position in the selling organization of the Hope Webbing Company, Pawtucket, R. I.

R. C. SIMPSON, formerly overseer of weaving at the Brookford (N. C.) Mills, has accepted a similar position at night at the No. 1 Mill of the Lancaster (S. C.) Cotton Mills.

J. L. WILLIAMS has resigned as overseer of carding at Grendel Mill No. 2, Greenwood, S. C., to become superintendent of the Panola Cotton Mills, of Greenwood.

A. A. BOWERS, formerly overseer of carding at the Panola Mill, Greenwood, S. C., now holds a similar position at the Grendel Mill No. 2, Greenwood.

H. E. STILL, formerly overseer of carding at the Ninety-Six (S. C.) Cotton Mills, has become overseer of carding at the Orr Cotton Mills, Anderson, S. C.

JOHN H. HINES, superintendent of the Columbus Manufacturing Company, Columbus, Ga., died at his home on Sunday morning, February 15th, at the age of 67 years. Funeral services were held on February 18th, from the Sacred Heart Church, Atlanta, with interment at West View cemetery.

JAMES BOOTH, a well known figure in the textile, mattress and waste industries for more than 25 years, died at his home in Philadelphia on February 7th. At the time of his death Mr. Booth was connected with Proctor & Schwartz, Inc. About 37 years ago, he began his career as a salesman, representing H. A. White, card-clothing manufacturer, of Worcester, Mass. Later he represented Decker and Bonitz, Philadelphia, soon afterward becoming connected with M. A. Furbush & Sons Co., Camden, N. J., builders of woolen machinery. In 1902 M. A. Furbush & Sons Company was absorbed by the Philadelphia Textile Machinery Co.; in 1905 a combination of the latter company and the James Smith Woolen Machine Company formed the Smith and Furbush Machine Company, which, in 1923, was merged with Proctor & Schwartz, Inc. Mr. Booth represented all of the companies in the order named.

J. D. BUICE has resigned as superintendent of the Chadwick-Hoskins Mill No. 5, at Pineville, N. C.

L. C. HARMON has been promoted to the position of night superintendent at the Cannon Mills, Kannapolis.

A. L. Rison, treasurer and general manager of the Dallas Manufacturing Company, Huntsville, Ala., died recently at his home, following an illness of long standing which was complicated by a throat affection.

C. E. WILLIS is now overseer of carding at the Social Circle Cotton Mills, Social Circle, Ga., succeeding Charles Walls, resigned.

T. R. MORTON has become overseer of spinning at the Lancaster Cotton Mills, Lancaster, S. C. He formerly was at the Gambrill & Melville Mills, Bessemer City, N. C.

H. K. ROBERTS has resigned as superintendent of the Vance Cotton Mills, Salisbury, N. C.

W. R. HILL recently became overseer of weaving at the Excelsior Mills, Union, S. C. He formerly was at the Alexander Manufacturing Co., Forest City, N. C., as cloth room overseer.

J. G. SANDERS recently became overseer of spinning at the Osprey plant of the Bibb Manufacturing Company, at Porterdale, Ga., succeeding G. R. Davis, who was made overseer of carding at the same plant.

C. T. FALLIN, well known in many southern mills as a successful cloth room overseer, having worked practically his whole life in this capacity in mills from North Carolina to Mississippi, died in Charlotte, N. C., on February 8th. For some time past, Mr. Fallin has been physically incapacitated for active work in the mill, but he has always kept up his interest in mill work and mill problems, and during the last ten or twelve years has been an occasional contributor to the columns of COTTON.

Applied with Kaumagraphs
TUESDAY, FEBRUARY 17, 1925.
FORSTMANN
F. & H.
FABRICS
Every Yard of Forstmann Fabrics is Stamped with this Trade Mark
How the Courts Protect the Honest Merchant and the Public

Counterfeiting failed because every yard of the fabric was marked!

FORSTMANN Fabrics are in big demand. Their success has brought inferior imitations, as great successes always do.

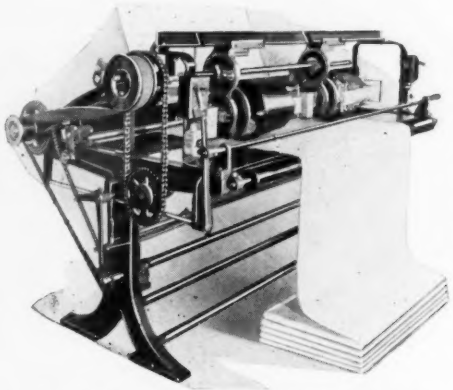
But every yard of Forstmann Fabrics bears the manufacturer's mark on the back, beautifully applied with Kaumagraphs.

The identity of these fabrics is thus irrefutably established. You can no more mistake a Forstmann Fabric than you can mistake the make of your car. No wonder the attempt to imitate failed!

The Kaumagraphed mark enhances the value of any fabric, because it absolutely protects the trade and the public against the substitution of inferior imitations.

Also, a beautiful Kaumagraph mark gives a fabric personality. Have your fabrics that? Are they *yours* or are they just so many yards of this or that kind of cloth? Would any competitor ever want to imitate them?

We should like to tell you of the many manufacturers whose goods have acquired personality through being given a name applied with Kaumagraphs.



The Parks & Woolson Kaumagraph Machine by which Kaumagraph Dry Transfers are applied to Forstmann Fabrics. This type of machine has a capacity of 90 yards per minute.

The Kaumagraph method of marking is simple. It is economical. It is adaptable to all and any requirements. If you have never been able to find a way properly to mark your product, write us. If you now mark your goods by some other process, get the facts about Kaumagraphs for comparison. There is no obligation in asking for full information. Use this coupon in writing, if more convenient.

KAUMAGRAPH COMPANY
350-356 West 31st St., New York City

Canadian Branch
Kaumagraph, Limited, Paris, Ont.

Boston Chicago Philadelphia
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350-356 West 31st St., New York City

Please send us full information about Kaumagraphs with samples.

Name .....

Address .....

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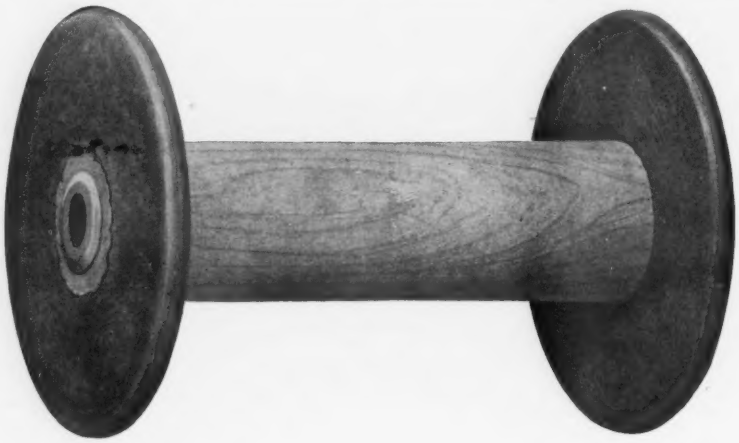
Facts About Fibre Head Spools



THE U S Bobbin & Shuttle Co. originated the round bevelled head bushing and method of application, without which the fibre head spool would be a failure. Fibre. is expensive, is heavy, and fibre head spools are not always by any means the wisest choice. Many times a lightweight softwood spool or the Boynton Shield protected spool is advisable, depending upon the work to be done.

We guarantee our fibre head Spools to be the equal of any that are on the market, and will make good any that prove defective under ordinary use.

There are certain advantages in using a fibre head. One of the greatest being thin heads which allow a greater traverse for the same length over all as a wood spool, and freedom for some time from rough edges which frequently develop on the heads of wooden Spools.

Our method of applying the fibre head to the wooden barrel is unexcelled and we take extra precautions in manufacturing these spools to maintain the same high standard of U S Quality that marks our other products.

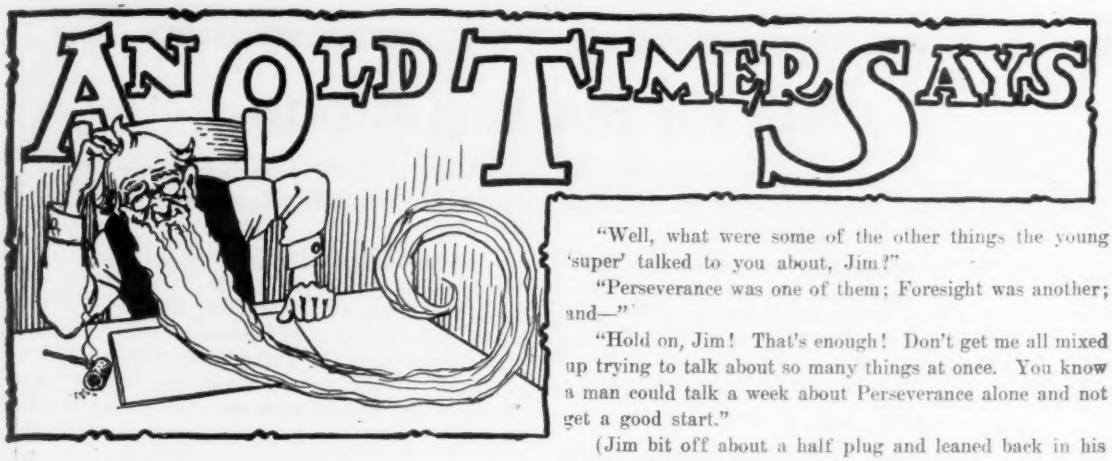
There are two types of fibre head spools on the market; the soft or laminated fibre and the hard vulcanized fibre. We recommend the latter.

If you are interested, be sure to write us for samples and prices.

U S BOBBIN & SHUTTLE Co.

LARGEST BOBBIN and SHUTTLE MANUFACTURERS in the WORLD

Eight Factories Providence R.I.



Well, I suppose you have just about forgot my friend Jim by this time, as he has not paid me a visit since some time last summer. However, I just had a personal letter from Jim and he told me about a recent conversation he had with a *big* mill man and how his friend had told him he had not quit reading the "Old Timer" article in COTTON for July, 1924, yet. The *big* mill man said he got a new thought every time he read that article.

Incidentally, that gave me a new thought: I am going to write my Editors that they can just publish that article again and save me a whole darn lot of work—well, I guess not, either, for Editors are queer animals, at least all I ever came in contact with are, and I know my two-cent stamp would be spent extravagantly in writing them about it——

Three Nights Later:

A large drive belt took a notion to quit the other night and I had to go to the mill, which broke into my plans to finish this article that night, so I am now at it again.

I started out to tell you about the letter Jim wrote me and what the big mill man said—Darn the luck, somebody's at the front door and I'm interrupted again!

Bless my soul, if it ain't Jim!

"Hello, 'Old-Timer,' how's things?"

"Fine, Jim, you old geaser, why in thunder haven't you been over before now?"

"Gosh, the roads have been so bad I couldn't make it. I've been wanting to come over to tell you some more about what the *big* mill man said about the article in July COTTON."

"Good boy, Jim, you know it always does an 'old-timer' good to know he has been able to be of some inspiration to the people he is trying to reach through his writings."

(I only wish it was ethical for me to relate here the actual conversation that Jim and the *big* mill man had, as Jim related it to me, but I am afraid it would be of too personal a character, and then there are those Editors again; I know it would never get by them.)

"You know, 'Old-Timer'," continued Jim after he had told me about his conversation, "there were several things that my young 'super' mentioned which you never have finished telling me about. You got such a start on that Opportunity stuff, as reported in the July article, that I thought you never would let up, and for goodness sake don't get wound up on that again tonight."

"Well, what were some of the other things the young 'super' talked to you about, Jim?"

"Perseverance was one of them; Foresight was another; and—"

"Hold on, Jim! That's enough! Don't get me all mixed up trying to talk about so many things at once. You know a man could talk a week about Perseverance alone and not get a good start."

(Jim bit off about a half plug and leaned back in his chair, as good as if to say I'm all set, shoot!)

"Of all the 'keys to success' or fortune or to anything else in our work," I continued, "there is nothing which will give a man greater returns for the amount of effort expended than Perseverance. Perseverance is the one best side-kick to any man who is *foresighted* enough to see and grasp his Opportunities—"

Jim almost fell out of his chair as he yelled out: "I thought the agreement was that you would lay off of that Opportunity stuff. I've heard Opportunity so blamed much that I dream about it."

"Bully! That's what I call getting results, Jim. Now if I could only get about one reader out of ten to—"

"To go nutty over Opportunity like you have got me?"

"Oh, well, I'll not use the word again tonight," I promised "—if I can help it. Getting back to Perseverance, some big guy said one time that 'Success comes to the man who determines to Persevere.' Most every invention that has made fortunes has been the result of days, weeks, months and often years of hard persistent work—

"That is Perseverance!

"Most all big fortunes have been built up by some man who had a dream and kept doggedly at it through a lifetime—

"That is Perseverance.

"The most successful overseers and superintendents are men who have had to go through the hard knocks of bitter experience, but who have forever had it in the back part of their heads to get there—

"That is Perseverance.

"Most all of the big mills of the South today have been built and have continued to grow because of the fact that there was at least one man who had a head and heart full of that stuff they call Perseverance.

"Talk about Genius and all that sort of thing, Jim, but believe me, I'd rather have a good level bushel of Perseverance than a whole darn hogshead of Genius. I always did think that those fellows they point to and say, 'There's a Genius,' were sort of darn fools anyway.

"You may study all the history from the Year One up to the time we will have the next eclipse, and you will find that Perseverance has been the backbone of every big thing which has been done. You know those pyramids that were built somewhere in Egypt have been there so long that King Tut's school teacher told him what a great thing

(*Continued on page* 481.)

Not for the Big Alone

An adequate Accounting Service is much more of a problem to the small concern than to big business.

The necessity for right Method and System is apparent to both. The only difference is that the smaller concern feels that it can not afford to have it, while big business knows that it can *not* afford to do without it. Yet the principles of accounting are the same in each case.

Long and varied experience in serving big business, nation-wide in extent, has given the Ernst & Ernst organization special facilities in Accounting, System and Methods, which make their service applicable to all business, whatever its size.

Our service to the smaller concern is not big business service cut down to save cost. It is a special service of the highest merit, specially adapted to meet individual requirements. It is wholly adequate and easily obtainable at a cost in keeping with the size of your business.

The Service covers all accounting problems—monthly or continuous audits, costs, and all other business systems, tax service, etc.

ERNST & ERNST

AUDITS—SYSTEMS—TAX SERVICE

NEW YORK	BALTIMORE	PITTSBURGH	DETROIT	MINNEAPOLIS	DENVER	NEW ORLEANS
BUFFALO	WASHINGTON	COLUMBUS	GRAND RAPIDS	MEMPHIS	OMAHA	DALLAS
ROCHESTER	RICHMOND	YOUNGSTOWN	KALAMAZOO	ST. PAUL	SAN FRANCISCO	HOUSTON
BOSTON	CLEVELAND	AKRON	WHEELING	DAVENPORT	LOS ANGELES	FORT WORTH
PROVIDENCE	CINCINNATI	CANTON	ERIE	INDIANAPOLIS	ATLANTA	SAN ANTONIO
PHILADELPHIA	TOLEDO	DAYTON	CHICAGO	ST. LOUIS	JACKSON	WACO
		LOUISVILLE	MILWAUKEE	KANSAS CITY		

NOMARKOFF

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RUBBER COVERED ROLLS

FOR

Gingham MILLS

DYE WORKS BLEACHERIES

STOWE & WOODWARD CO.

NEWTON UPPER FALLS, MASS.

HOW OTHER MEN MANAGE

Practical Discussions by Cotton's Readers On all varieties of Mill Subjects

Increases Production 43 Per Cent.

EDITOR COTTON:

Under the heading, "A Question for Spinners," "W. E. (Ga.)" asked for some discussion on his idea of cutting out on double creel roving in the spinning by doing the doubling in the card room, fixing the trumpets on the traverse rod on the intermediate, for example, so as to have two ends running side by side in the drawing rolls, etc. It seems to me a more appropriate title would have been, "A Question for Carders."

I thought this idea was worth trying, anyhow. In one of our spinning rooms is a small amount of 17s warp which, due to unavoidable circumstances, is spun from single creel 2.20 hank intermediate roving. The draft is 7.63. The intermediate draft is 6.75, the twist is 2.34, and the twist gear is a 16. Double creel here of course.

Now for the change: Every other trumpet on the intermediate traverse rod was replaced with a slubber trumpet and four strands of slubber roving fed in each trumpet, thus using only one-half the rolls and spindles on each frame.

The draft was lengthened to 8.22 and the roving at the front sized near 1.50 hank, after the twist was reduced to 1.63 with a 23-tooth twist gear. The lay, taper, and tension gears were regulated to suit the roving.

The spinning frames were creeled with the 1.50 hank roving, and the draft changed to 11.59, single creel as before. It sized near 17s yarn. The intermediate bobbins weigh 30 ounces when full, and there is no difference in the run out in the creels; in other words, the spinner has no more creeling to do than she had before. These bobbins run out every two and three-quarter days.

This is a double creel roving in the sense of doublings only. The twisting advantage obtained after double creel roving leaves the bite of the front rolls is not obtained in this single creel "double creel" work. Plying would be a better term than twisting. This work runs much better than the single creel we had and the spinners like it much better than the other as they do not have half the ends to come down as before.

Actual comparison for breaking strength based on Draper's standard showed that the average gain in breaking strength was three pounds. This average was taken from four tests per day on each method over a period of ten days. This system might not show any results if the yarn is close to standard strength.

The intermediates are doffed more times a day, but it takes but half the time to doff. From the looks of the ends on the intermediate there is no such thing as stretched roving.

The seven teeth of twist taken out gave forty turns increase in front roll speed, or approximately *43 per cent increase in production.* Now if someone will devise a creel so that the idle spindles can be utilized, one frame will be doing the work of 2.86 machines.

The only disadvantage is that should an end break back in the intermediate or speeder creel a long singling would be made. The end will not come down. If the frame hands are trained correctly, this should be no drawback.

These are the results I obtained in a comparatively short time, and I have not finished with this yet. I intend to try this same system on speeders, where the drafts are not so long and the breaking strength is close to standard.

I hope to see some good articles or results regarding this in "How Other Men Manage." L. K. R. (TENN.)

We invite our readers to make use of this department for the discussion of any and all problems arising in the mill or the finishing plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

Top Leather Rolls and Fluting.

EDITOR COTTON:

Sometime ago I wrote an article on the causes of top leather rolls fluting, but some of the readers did not agree with me. Since that time I have made several experiments to ascertain the real cause of a top leather roll fluting. I found the exact size of my steel roll and then went to the roll coverer and asked him to make me eight rolls 1⅛ inch, the same size of the steel roll. I have run these rolls now about eleven weeks and none of them have fluted as yet. I put in eight top leather rolls that sized about 15/16 to 1 inch, a smaller size than my steel rolls, and one of the 15/16 size rolls fluted. I then put in some rolls that were covered with different thicknesses of skins, eight in number. Three of these rolls fluted, the size of these rolls being 1 inch against a steel roll size of 1⅛ inch. So you can readily see that the size of the roll has no bearing on the top leather roll fluting.

When I was a second hand, I at one time had an overseer tell me that the size of the top leather roll had nothing to do with it fluting, so since I have been hearing so much about fluted top leather rolls I pulled my old hat down on my knot and have tried to find the real cause. From numbers of experiments that I have made since March 18th, 1924, I have found that inferior stock, together with poor workmanship, cause top leather rolls to flute. Another thing which I have learned by these experiments is, that after a top leather roller flutes it will not make good, smooth, even roving or yarn.

I am not offering this in the spirit of a know-all, but

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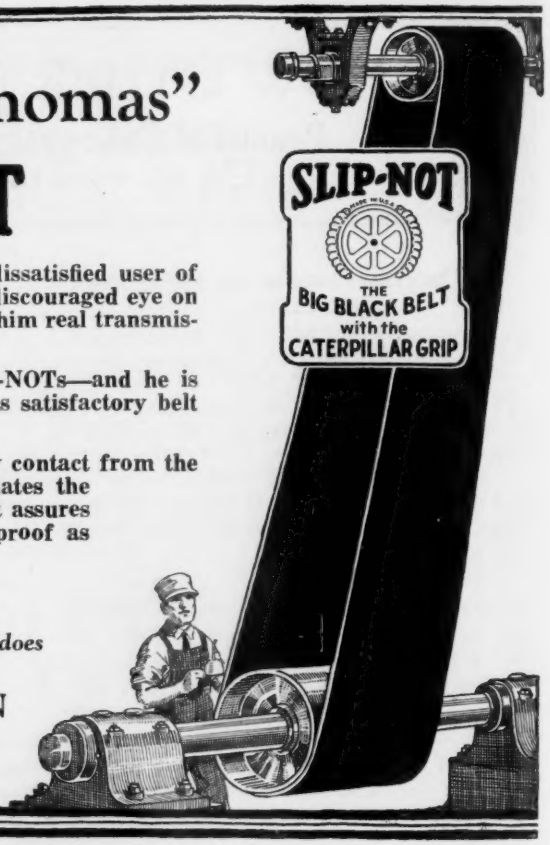

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just to show what good points one may gain by intelligent experimenting. A superintendent once told me that he did not believe in so much experimenting. However, if we never try these things we may never learn whether or not they will work.

I should be glad to have several men of long and varied experience try what I have tried on top leather rolls in regard to the cause of fluting, and I believe after they have gone through with several experiments looking for the real cause their answer will be the same as mine.

There is a great deal to be gained by experimenting if one will go about it in the proper manner and not take the attitude of the "know-all" and seek to find what one is looking for.

I am looking forward to reading some experiments on top leather rolls fluting, the causes and the remedies.

A. B. (GA.)

Sizing Wet Warps.

EDITOR COTTON:

Referring to a previous communication in the "How Other Men Manage" section of COTTON for December, 1924, on sizing wet warps, "N. P. R." advises the use of 75 per cent sulphonated oil utilized in a certain manner in connection with the size mixing.

We have tried using, in sizing our product, the following formula:

190 pounds 40 fluidity starch,

18 pounds 75 per cent sulphonated oil, making a total of 250 gallons of finished size.

So far we have had trouble in that the size foams at the size box and we have been unable to eliminate this difficulty. I shall appreciate it if "N. P. R." will tell us if he can give us a remedy for this foaming. Possibly we are not mixing it at the proper temperature or some other little difficulty. I shall look forward with interest to hearing from this correspondent or others.

CONTRIBUTOR NO. 519.

More Regarding Fluted Rolls.

EDITOR COTTON:

In October COTTON, "A. B. (Ga.)" gives some causes of fluted top rolls, and in December "T. A. A. (S. C.)" comes back with a point that throws more light on the subject. Since neither of these gentlemen mentioned it, perhaps I should call attention to the fact that all steel rolls are fluted irregularly to prevent the cutting of flutes in top rolls. If bottom rolls were fluted regularly, like gear teeth, it would be very difficult to keep the top roll from indexing with these flutes, as there is always a slight variation in the sizes of top rolls due to different leathers and different weights of cot. On account of these variations, there would certainly be a high percentage of top rolls in any room that would have a circumference such that the difference between the circumference of the top and bottom rolls would be equal or very nearly equal to the width of one or more flutes. In that case, the two rolls would work like gears, and the fluting would be prompt and serious.

Since bottom rolls are irregularly fluted, unless top and bottom rolls are exactly the same size, the flutes in the bottom roll will always touch in a different place on the top roll at each revolution. I have not at hand a table showing manufacturer's standard sizes for top rolls to go with various sizes of bottom rolls, but the two should be of slightly different diameter.

While, as "T. A. A." states, the thickness of the cot will affect the diameter of the top roll, it should have a very minute effect, most of the variation coming from variation in the leather. Of course, if both were heavy, or both light, there would be a compounded variation, and where the cot was too light, the leather would be too loose on the cot, and might get baggy and flute on account of being so loose and soft. If leathers are wound around an arbor and cemented, they will all be the same size inside, and it will take a pretty thick cot to stretch the covering enough to make a difference in diameter. A difference in the thickness of leather will affect the roll diameter directly, of course.

"A. B." seems to have summed up most of the causes of this fluting, and nearly all of it seems to be caused by poor workmanship or materials in the roll covering department.

Many mills try to economize by using the old cots as long as they will hold together at all, and put several coverings on the same old cot. This seems to be poor economy, as the old cots have lost much of their elasticity, and are often oil-soaked. It would no doubt be cheaper in the long run to always put on new cots when new covering is needed. Also it is poor economy to use anything around the belly, as this scuffs easily and is not so uniform in thickness as the back of the skin. It would be cheaper to throw away any imperfect leather than to go to the expense of putting it on rolls and then throwing it away.

L. D. (MASS.)

How Small a Circle Can Be Used on a Ring Traveler?

EDITOR COTTON:

There is one point on spinning that I have always wished to discuss with someone, but as yet have not met the man who could give me all the information I wanted. Therefore, I am putting it up to the readers of "How Other Men Manage" for them to discuss.

The point I have in mind is, just how small a circle can be used on a traveler—and if a very small circle is used on a traveler, one that fits the ring very closely, would it not be beneficial?

The greatest proposition in manufacturing is quality, and while we all know that roving should be delivered to the spinning room even, of the right weight, and free from imperfections, still I think all of us have some trouble with slugs. Would it not be possible to traveler the yarn in such a way that the traveler will absolutely refuse to allow any imperfections to pass by, but would break the end down instead?

Of course, this is more or less theoretical and some might say that the percentage of ends down would overcome any benefit caused by keeping out slugs, but there has been more exploitation of slub catchers in the past two years than ever before. Why not, if possible, set the spinning frame to do this work, and leave only piecings for slub catchers to catch, which any of them unquestionably will. I do not make a point of this, but it has interested me, and I believe if it is considered seriously, we might have

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some interesting discussion on it. What do your readers think of the idea? J. W. (GA.)

An Old Timer Says—

(*Continued from page* 475.)

it was to build them."

"What's become of them, 'Old-Timer'?"

"You idiot! They are standing right there yet. Built when people had no derricks, no hoisting engines nor gasoline. Now what I am coming to is this: the guy who started that pile of rock had *some* Perseverance.

"So you see, Jim, Perseverance is nothing new, it has been a big thing always, forever, and always will be. Of course you want a little other stuff mixed along with it to keep it tasting good, just as some people like a little sugar in their toddy. (Yes, Editor, this is a correct word.) You must have will-power, endurance, and a lot of ambition, but since I have thought over it I have never seen a man of much Perseverance who did not just naturally fall into these other qualities.

"Jim, if you're sleepy, we'll turn in."

"Hell, no, 'Old-Timer,' I was just closing my eyes to be able to drink in the full meaning of what you were saying. Didn't you know a man can concentrate much better with his eyes closed than with them open? Because anything that catches his eye is liable to lead his mind off the track, so to speak."

"I never thought about it just that way, Jim, but since you have given me the thought I do know that a man always lowers his head when he is in deep thought." (And you, Reader, sometime when you catch yourself in deep thought, suddenly hold your head up and throw your shoulders back and see if you can continue in your deep thought. Sounds strange, but you can't do it.)

"What I am trying to push into that old bald head of yours, Jim," I continued, "is that there is a big difference between Perseverance and Ambition.

"Ambition is not worth three whoops in purgatory without Perseverance to back it up. You know, most all of these young fellows would like to have your job or mine. Well, that is one form of ambition, but have they got the Perseverance to keep digging until they reach the goal? Catch the thought, Jim?

"There is also a lot of individuality in Perseverance. That is, one man perseveres in one way while another goes at it in an entirely different way. That explains why one man may be a successful overseer or superintendent and still go about his work in an entirely different way from the methods another man uses.

"But the textile industry needs men of Perseverance. It needs what you, the individual, only can produce. You can serve it, and if you will, it will reward you handsomely. Sometimes I think, 'Oh, what's the use of forever and eternally hollering at these overseers and superintendents like we do, because some of them remind me of the fellow who remarked, 'Wish I had enough money to get married.'

"'Why, what would you want to do that for?' asked his friend.

"'I wouldn't,' he answered, 'I'd buy a car.'

"That is just the way some of them feel about the big job they long for—when it comes to the show-down they are content to shuffle along in the same old rut.

"Just why they can't see that the road to success is not crowded I don't understand; in fact, on the road to success it is almost lonely, there is so much room, and if a man wants to, he can surely step on the gas.

"I saw in the paper that Edison celebrated his 78th birthday in Florida some time back and I saw something in another paper about the eight-hour day. Now, Jim, wasn't Edison lucky that there was no eight-hour day or ten-hour day when he was a young fellow? If there had been he would not be the electrical wizard that he is?"

"Yes, 'Old-Timer'," agreed Jim, "you just have to drag some of these young overseers along like the calf did my young brother Bob when we were boys on the farm."

"How's that, Jim?"

"Well, the old man gave Bob a young steer and Bob thought he would do something smart, so one Saturday afternoon he yoked himself by the side of that steer and told me to come on and help him plow his corn patch. The blamed steer wouldn't pull, so I reached over and twisted his tail. He gave a snort and away he ran. Of course Bob, he had to run, too. As they went tearing down the road by the house, Bob yelled out, 'Here we come, darn our fool souls. Somebody head us off!"

"Pretty good, Jim. I guess some of them should be hooked up with something.

"Let's go to bed!"

Another "Old Timer" Speaks Out.

EDITOR COTTON:

I have just completed re-reading "Old Timer's" reprimand in the January issue of COTTON. Among all of his articles along similar lines, to my mind, this last one, makes his others more or less obscure. While he has been hammering home various facts, undoubtedly this last effort will be appreciated by thinking men wherever it is read.

I think (get that) I know "Old Timer." In my memory files I recall connection with a then splendid mill where he was overseer of weaving and was among the very youngest overseers of the South some twenty odd years ago, and to follow his ventures is very interesting, especially his phenominal success. When I began writing this I had not intended to eulogize "Old Timer," but I must say that his pen has been an inspiration to many men with the "makins," and the seeming loss of his temper may well be construed as enthusiasm. I trust he will keep up his good work, as his methods will win.

About six years ago I remember that a superintendent friend of mine, a big, strong, healthy man with lots of ability and a salary of forty-two hundred dollars a year approached the president's desk and offered to sell him his services for life for three thousand dollars a year. He said frankly and miserably, "I am scared when I look down the highway of the future. Every time I think of my wife and my children and realize the awful responsibilities which rest on me, I get panicky. I am continually haunted by the dread that my job will 'peter out' and that I will find myself broke." The man to whom the proposition was made replied: "I would not agree to give you even your board and clothes on any such basis as that. You are worth three hundred and fifty dollars a month to me now, but you would

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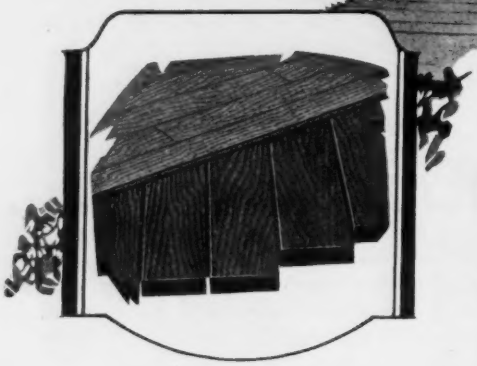

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not be worth anything to me then. Your incentive would be gone and you would lie back in the knowledge that you had three thousand dollars a year coming to you whether or no and that you couldn't make any more no matter how hard you tried. It is my opinion that under such circumstances you would not be worth your keep." He was right. There must always be some incentive to keep a man going. Some men will work for the love of work, but there are few of those. Some men will work because they are ambitious, and there are more of those Others work because they have to work, and there are the most of those.

Arrange things so that we could earn enough in a day to keep us a week and most of us would work only one day a week. That is why some sons of rich men usually amount to so little. They have all they want without working for it. There is nothing to spur them on; nothing to keep them on their toes.

There was once a brilliant, handsome young fellow who inherited a life insurance payable at the rate of one hundred dollars a month. Every time his check reached him he would quit work until his hundred was used up. Then he would go to work again until his next check arrived. That inheritance of one hundred dollars a month was the greatest curse that could have befallen him.

Yes, it takes incentive to make them work. It must be the urge of natural energy; it must be the striving for a goal, or it must be the necessity of providing for someone. Most people are lazy. They are born tired. Laziness is one of the things that humans have to learn to overcome, along with bad temper and selfishness and a love of scandal and a lot of other undesirable tendencies. The trouble with the superintendent who wanted to sell his services for life was that he looked down the highway of the future instead of up, and he pondered his awful responsibilities instead of his glorious opportunities.

I should like to ask the readers through this practical discussion department—"where do you fit in this world of ours, with its hustle and bustle and work? Are you one of the throng that helps it along or are you with those who shirk? Do you hit the job with a smile or a frown? Do you carry a grouch all day? Are you one of the flock that watches the clock? Are you working for more than pay? Is your job man-sized and worth the while when you've tallied up your score? Are you keeping fit and doing your bit and perhaps a wee bit more? Are you one of the average just drifting along? Are you listed as profit or loss? Are you stalling for time or starting to climb? How much are you putting across?" And I should like to say to them:

"Just pull in your slack and count up your score. Locate what you are aiming to hit. Don't waste ammunition and all your ambition, but find out just where you fit."

V. O. N. (N. C.)

Appreciates "Old Timer's" Letters.

EDITOR COTTON:

In looking over the August, 1924, number of COTTON and reading that grand letter of "Old Timer" by gum! it put me to thinking that we certainly do have lots, yea heaps of trouble during our short stay on this old mud ball. How many of us, I wonder, have thought that we were just getting along fine when there would come, all of a sudden a crack like a thunder bolt from the heavens and knock our old trotters clean from under us. Then there we are, set back another few years. Then we say, "Oh, what's the use anyway?"

I wonder if it ever occurred to any of the readers that at times the only friend they had was themselves and at times even doubted that. And how many have had it happen to them that when they thought they were getting along just tip top, or seeming to, their employer, for no apparent reason in the world but to give a friend a job, would fire them and put the friend in their place. Some world! And some people who go to make it up. Then we have to start over again just when we thought we were going great and were sitting right in the middle of flowery beds of ease waiting to be ushered into Paradise.

"Old Timer's" letters will certainly put a fellow to thinking and keep him thinking, for you cannot tell today what tomorrow will bring forth, and I, for one, think "Old Timer's" letters from month to month just cannot be beaten, for he certainly hits the nail on the head, and he never gives it a glancing lick but drives the center every pop.

I could not wait any longer to let you know just how I enjoy reading these letters from "Old Timer."

BAB (N. C.)

A Question for Weavers.

EDITOR COTTON:

In making three harness 4.00 yard twills, will the position of the harness, two up and one down or one up and two down, have anything to do with the reedy appearance of the cloth? In other words, if you were making a light weight three harness twill, running two up and one down, and there was a great deal of the reedy appearance in the cloth, do you think the trouble would be remedied to any great extent by changing to one up and two down?

I shall be glad if some of the readers of your discussion department will take up this matter and give me the necessary information as they see it.

R. O. (S. C.)

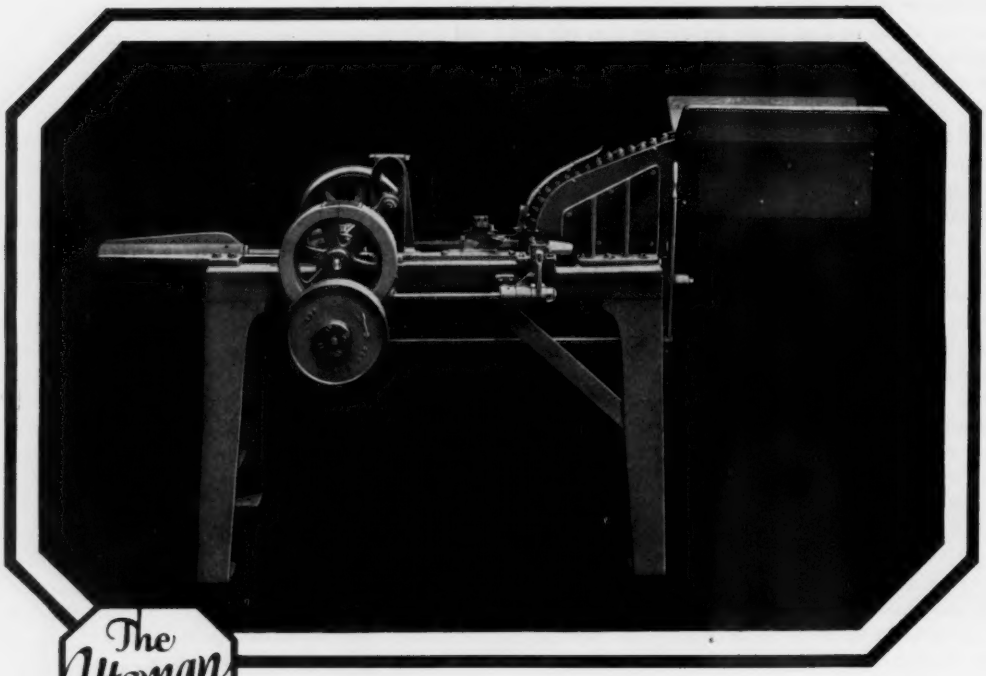
Light Red Print.

EDITOR COTTON:

I am enclosing herewith a sample of printed cloth which you will note has a very high face luster. Will you please have some of the contributors to your discussion department advise the best way to imitate the finish on this sample and especially how to secure the face luster referred to? D. Y. (WIS.)

EDITOR COTTON:

Replying to the inquiry of "D. Y. (Wis.)," would say that I think the goods (after bleaching) are dyed a cheap red, then are printed with a yellow discharge, or they may be dyed yellow and printed red, etc. Anyhow, they are starched pretty stiff after dyeing and printing or the starching may be done in the printing paste. They are then run damp over the tentering machine to full or overfull width, then damped, run twice through the 4-boll calender or through four nips of hot steel cylinder (paper or cotton) or friction calender on one side (friction or not according to pattern). It must be understood that



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the "face luster" is best got on a friction calender—two runs (or more) damp and hot, and on one (face) side—2 nips each time or one and two.

I hope this will answer "D. Y." in full. W. B. (ME.)

More Than Three Thousand Alibis.

EDITOR COTTON:

I note with disgust in the December issue of COTTON "The Watchdog of the Mill," by "Contributor No. 3649." So far as I can figure out, Thirty-six Forty-nine is trying to be funny, but I'll bet my best pair of pants against his last chew of tobacco that his peculiar, not to say absent brand of humor is due entirely to the fact that he is a weave room overseer.

I wouldn't be at all surprised if his cloth room man hasn't shown him up about a few things lately which accounts for his trying to soothe his feelings by throwing off on him. As a cloth room man of several years successive and successful standing I feel justified in saying that if it were not for the cloth room overseers, the average weaver wouldn't have any more chance of holding his job than the traditional paraffine dog would have of catching the asbestos cat with the brass legs along Avenue 212°, Hades.

Thirty-six Forty-nine says the cloth room boss is a constitutionally sour individual with no ambition at all, except to find defects in what somebody else has tried to make. "Tried" is a good word which he probably used unconsciously, but it fits the case. That's about as far as most of them get, and I have seen a lot that I do not think ever got quite that far. As for we cloth room men being of a sour disposition, what else can you expect when you take into consideration what comes in from the weave room, up to and including the boss thereof? I think I can assure everybody within hearing that the ambition of the cloth room man is not to find something bad, but to live long enough to find something good coming from the weave room so that he can lie down and die happy in the idea that he has been favored beyond his reasonable expectations.

The average boss weaver is a man who can take a lot of perfectly good yarn, ruin it on the slashers, run it into a lot of crossed up warps, put the wrong filling in it and the wrong weave on it, get the picks, width, ends and weight all wrong, and then prove that it was all caused either in the opening room, or more likely in the cloth room, but never in the weave room, and keep everybody else around the plant up nights and on the anxious bench all the time wondering what ails the place, while he goes to the ball game or the movies with a perfectly clear conscience and the unalterable conviction that all that is needed is a new set of overseers (all except himself) to make the best mill in the state. Furthermore, if anybody does clamp down on him hard enough to prove that any bad work actually came from his department, he can always find 3649 reasons why it could not have been helped.

Probably that is why 3649 used that number. It perfectly fits the number of alibis possessed by the majority of so called weavers. There are 1397 in the card room, 1034 in the spinning room, 1195 in the cloth room, 22 in the machine shop and only one in the weave room and that goes "That was the day I was out on account of my wife being sick, and the second hand done it."

Like most other pestiferous insects, the weave room boss is supposed to serve a good purpose. It is probable that the carder and the spinner would get too good an opinion of themselves if the weaver did not show up their bad yarn when they made it, and it is conceivable that a reasonable vigilance along that line might be beneficial, but the majority I have known in a long and useless career have spent most of their time running around with a handful of gouts and bad filling, kicking up a dust about bad yarn as a smoke screen for the bad work that was going on in the weave room.

There is one good and useful purpose that weave room overseers could serve if it were possible. I have often thought that their hides were so tough they might make good pickers, check straps and other loom strapping. I have been wanting to try it a long time, but the S. P. C. A. won't let me. WATCH DOG (GEORGIA)

The Cloth Room Overseer

EDITOR COTTON:

I would like to make a few comments on the remarks of "Contributor No. 3649," regarding the cloth room overseer, as published in the December issue of COTTON.

He calls the clothroom overseer an insect, and a boss. Well, there are good insects, and bad insects. The clothroom insect has to stand all the gaff of all the other insects—the boss weaver, the boss spinner, the boss carder, and all the other insects around the mill, stinging him on one side, because he must show up the mistakes they have made—when they had their shoes off their feet as well as their minds off their work.

If they would take their chins out of their hands, and get out of their chairs and attend to things as they should, the clothroom overseer would have an easier time of it. But no, they must pass it along to the clothroom, saying, "They will find it." And when it is found and they are told about it they throw a fit.

He also mentions the fact that the clothroom boss doesn't look pepped up on payday. Why should he? Isn't the pay of the clothroom boss the smallest of any of the department heads? And he gets kicked from all sides. "Contributor No. 3649" says the clothroom boss is sour. Can you blame him?

Sure, "anybody can cut rags." But it takes the boss weaver to make them. That is the way with most overseers, but the boss weaver takes the cake. He doesn't make any seconds. Oh, no! He is the only thing that ever happened according to his own estimation. But I can tell him one thing—it isn't the machinery that has whiskers on it. Positively not, it's the boss weaver, with cobwebs on his brain—from too much "Rip Van Winkle" stuff.

I've never yet seen a boss weaver who wasn't busy—but I can't tell you "what at," unless it was snoozing.

On the other hand, if the clothroom boss lets anything get by him, he hears something drop. The superintendent, agent, etc., "ride" him and ask, "Can't you make better cloth?" Oh, yes, the clothroom boss is sour, but I doubt if he is as sour as the boss weaver looks when he sees his seconds mount.

Which of the insects are the worst—the bosses on one side of the clothroom, or those in the office? It's a problem.

But there's no getting out of it; the clothroom boss is sandwiched in between a hard bunch of insects.

I. M. (CONN.)

One for the Kloth Room Klan.

EDITOR COTTON:

Please allow me space in your valuable paper to reply to the article entitled "The Watch Dog of the Mill."

In the first place, a concern as large as a cotton mill needs someone to watch, and of course it is the place of the overseer of the cloth room to do this work. I must say that the man who wrote the article surely has a guardian, or, in other words, the mill with which he is connected has a good cloth room man. I know many overseers of weaving in mills where, if it were not for the "Watch Dog," they would last just about as long as a feather in a furnace. But still, they catch the—you know what—from the boss weaver.

A cloth room overseer does not get any credit for the seconds being low. No, no. The weaver gets it all. However, if it were not for the poor cloth room man looking after things, sending notes to the weaver every few minutes in the day about so-and-so going wrong, the weaver would walk up and down the aisle day after day, chew his tobacco, look at the ceiling and never see what was going wrong. It is not to be wondered at that there are so many bald heads among the cloth room men. They bear the load of the cloth room, which I must say has more responsibility attached to it than any other department of the mill, because it really carries the mill.

The cloth room man, if he does his duty to the mill, also helps look after the weaving. I do not mean that he is held responsible in any way for the weaving as far as the responsibility for production goes, but for the reputation of the mill, the president, the superintendent and the overseers. Also, you show me a mill that has a good name; work running satisfactorily and seconds low, and I will show you a good cloth room overseer or a good "Watch Dog." While not very many men, certainly very few superintendents, apparently appreciate the good work of the cloth room man they have trained, I must say the superintendents are better than any of the other overseers around a mill.

You will agree with me, Mr. Editor, a good cloth room man not only looks after his own interests but he looks after the interest of the mill. That is, he wants every yard of cloth supposed to be firsts to be firsts and every yard supposed to be seconds to be seconds. Therefore, under ordinary circumstances, the seconds will be low and the mill will have a good name and the superintendent will bear the reputation of being a good superintendent. The cloth room man did it, but he gets no credit for it. The "Watch Dog" gets knocked and kicked around, but the best cloth room man after all is the best "Watch Dog."

S. O. (GEORGIA)

What Other Men Manage With.

(*Continued from page* 455.)

or placed right in the neck without further ado, is not a good one. The moisture content of the grease evaporates, leaving the grease hard, and it will often be discovered that the roller neck is rusty under the lump of grease!

Obviously, the reason is that the revolving roll has cleared a passage through the grease, the latter shrinks some on evaporation, and does not come in contact with roll neck at all, Fig. 10. Chemical action sets in and a rusty roll neck ensues. Are there any removable bearings for the roller necks? Wood, metal? Are the bearings ever re-aligned? Is there a decrease in the depreciation of the roller by doing this?

The twister is perhaps the only machine in the cotton manufacturing process that has to have a daily application of grease. Obviously, some of the grease is going to splatter over the frames more or less. It does, and it makes the twisters a grimy, greasy affair. How does your guide arrange to have them cleaned? By hiring in young minor workers for this duty? Or do the twister tenders have to do it? Is there a cleaning squad? How do the machines compare in cleanliness with yours?

Another disagreeable feature in wet twisting is that of the stagnation of the water in the troughs. Some of the newer models of wet twisting have a drain pipe attached to one end of the trough by means of which the slimy water is continually drained off. A feed pipe at the farther end supplies fresh or cleansed water to the trough. Are your friend's machines equipped this way? If not, is waste used to clean the slimy contents of the troughs? Or is a brush used? Both of these methods give good results, depending somewhat on type of glass holder in the trough as to which system is best to use. Sometimes troughs can be cleansed running, thus eliminating the loss of production through the usual stoppage.

TWIST DETAILS

DATE
TWISTER NO.
YARN NO.

PLY

TWIST REQUIRED
TWIST GEAR
JACK GEAR
TRAVELER

ACTUAL TWIST:

BOBBIN NO.	1	2	3	4	5	6	7	8	9	10	AVG.
TWIST											

FIG. 11

A visit to the twisting room would hardly seem complete without having gone somewhat into detail into the matter of twist insertion and twist control. How is a record kept of the details of the twisting frame? A simple, yet effective plan is to have the details on a card hung to a hook on the end of the frame. Fig. 11.

How does your friend's twisting overseer get his twist constant? Does he use the constant as calculated from the spindle whirl, gearing, cylinder, and front roll? A large mill experience has taught the writer that the better way of arriving at a workable constant is to multiply the twist by the twist gear on a machine already running. For

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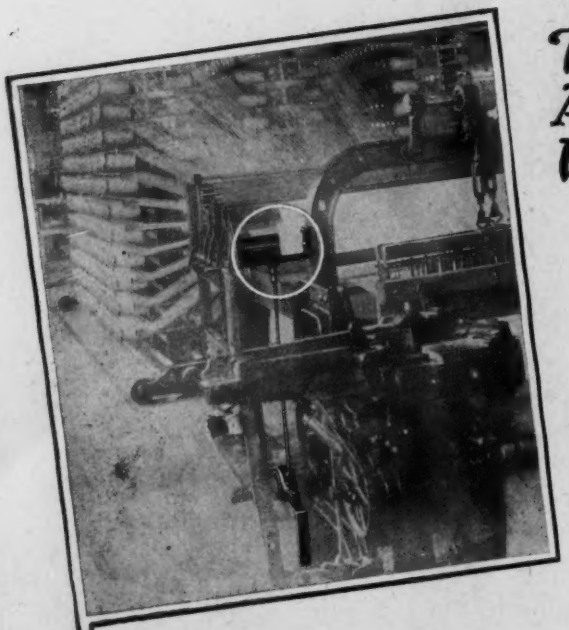

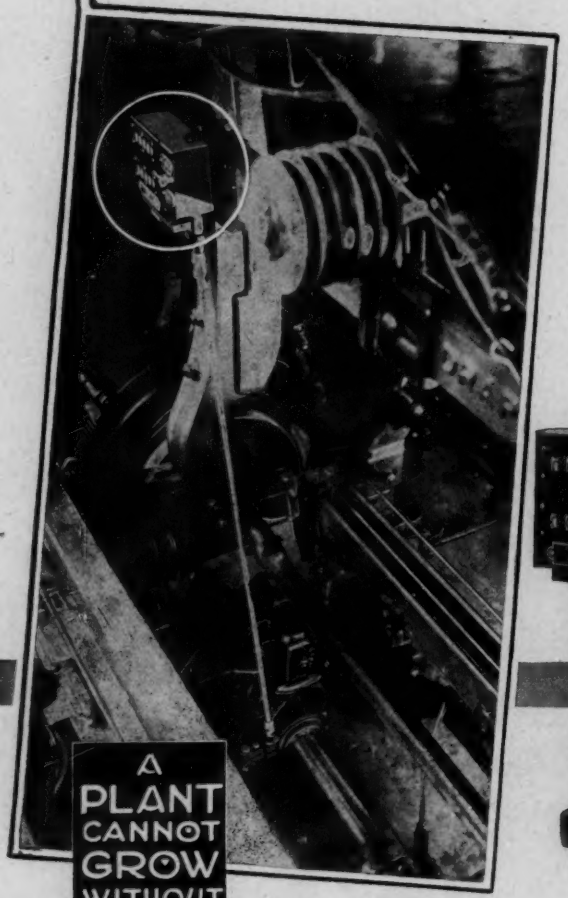

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instance, assume that 18 turns are being inserted and that a 20 twist gear is used. $18 \times 20 = 360$. This product is the practical twist constant and can be used to good advantage whenever yarns of the same ply and twist multiplier are twisted.

Who decides on the twist of the product? Has a test ever been made to determine whether the twist multiplier used is the best in the matter of quality and economy of manufacture? Presuming that the firm has changed cotton from time to time, taking advantage as far as it could in the matter of falling prices, was there ever a definite attempt made to ascertain the effect of slight changes in the twist multiplier, always keeping foremost in mind the one object of reducing the twist multiplier so as to increase the production of the twisters?

Who tests the twist on the machines to see that it is correct? And how often tried? When a machine is changed from one count to another, who tries the twist? Does anyone check the first person's test? Is a record kept of the twist thus taken together with the twist and other necessary gearing? How many bobbins are tested for twist at one time.

The writer has for years recommended taking 10 bobbins. Experience has shown that the vagaries of twist necessitate a somewhat extended trial in order to get a pretty good conception of the average twist being inserted. Another thing about taking 10 trials is that no figuring is required to get the average. Simply add the ten together and move the decimal point one place to the left.

How does your fellow-executive work out this problem in his mill? Is his way similar to the one explained? If different, do you consider it as good, better, or worse than your own? Worth while giving it a trial?

The twisting is perhaps one of the simplest operations in the textile repertoire. But simple as it may be conceded to be, there is a multiplicity of detail connected with it whose perfect functioning is requisite to make the twisting operation a successful one. And it is the handling of these one thousand and one details by the other fellow which is so vitally interesting and instructive to the visiting executive.

EDITOR'S NOTE—This is the sixth of a series of articles by Mr. Soniaman. The questions asked are open for discussion in our regular department entitled "How Other Men Manage." All readers are invited to participate. It is not to be expected that all will agree, but it is quite probable that each man will have his *reason why*, and that is what makes it interesting.

An Automatic Feeder for Two Boxes.

EDITOR COTTON:

Mills having only two breaker pickers that are interested in an automatic method for feeding the cotton into the hoppers may find something of value in the home-made device shown in the accompanying illustration and described in this letter. It is very simple, cheaply made, and serves its purpose without any attention whatsoever.

A box, *A*, Fig. 1, made of 20-gauge galvanized iron, 36 inches long by 24 inches high, is bolted onto a frame of 1-inch angle iron, which is fastened to the frame work supporting the condenser. This box *A* is open at the top and the bottom, and is only partially closed at each end.

To this box are bolted two chutes or inclines, *B* and *C*. These chutes are 17 inches wide and have sides which taper from 14 inches to 6 inches at the point where the cotton leaves the chute to drop into the hopper. A narrower chute does not work so well as the cotton is inclined to choke it up.

At the point *D* there is a ¾-inch rod on which works a damper or flipper *E*, made of re-inforced 16-gauge galvanized iron. This flipper is just large enough to prevent

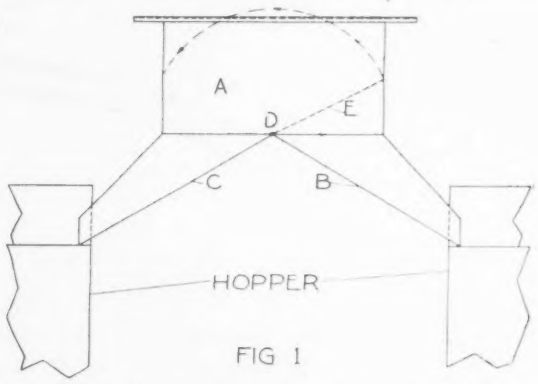


FIG 1

any cotton from going down either chute when turned to that side. In the illustration, this flipper *E* is shown closing the right-hand chute, allowing the cotton to go into the hopper on the left-hand side.

Now to describe the details of the drive for the flipper *E*, which are shown more clearly in Figure 2. The pulley *F* is about 18 inches in diameter, and is driven by a 1-inch belt from the line shaft, with the belt running on the shaft without any pulley. On the same shaft with pulley *F* is a small bevel gear *G* which drives bevel gear *H*, and on the

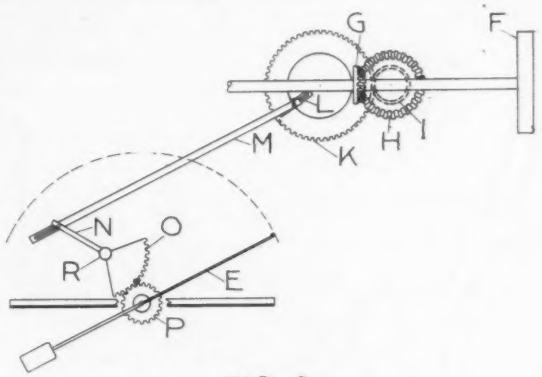


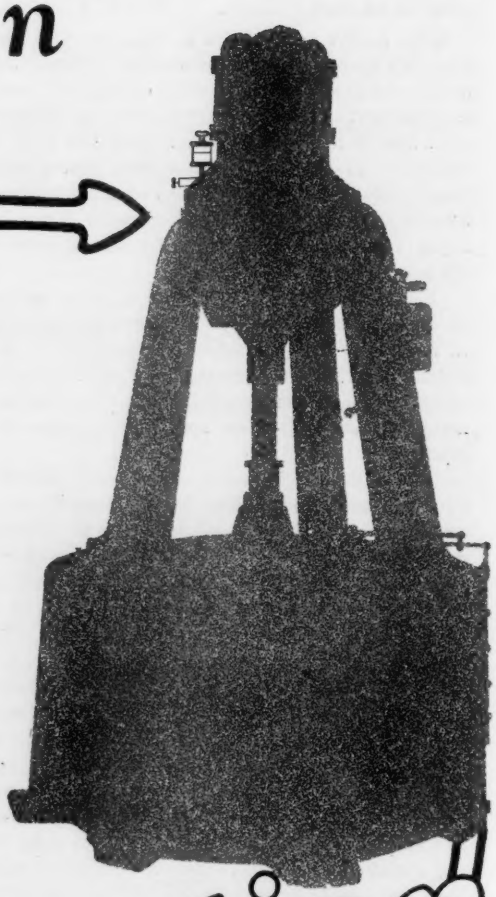
FIG. 2

same shaft with *H* is a spur gear *I*, which drives the large gear *K*. Gear *K* has a slotted strip *L* riveted to it with a slot for adjustment of the throw of the arm *M*. This arm *M* is fastened to *L* with a wing nut and bolt.

At the lower end of the arm *M* we find another slot about 5 inches long, with studs and wing nuts for the adjustment of the arm *N*, which is set-screwed to the same shaft with a multilated gear *O* which meshes with the small gear *P*.

This gear *P* is on the shaft with the flipper or damper *E*. As the pulley *F* revolves it causes the large gear *K* to revolve through the gears *G*, *H* and *I*. As *K* revolves, the arm *L* causes the lever *M* to oscillate from right to left and

Lubrication



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vice versa, which causes the lever *N* to oscillate to right and left about *R* as a center. This causes the mutilated gear *O* to oscillate, which in turn causes the gear *P* to oscillate. and since the damper or flipper is on the same shaft with *P* it also oscillates from side to side of the box *A* which allows the cotton to be fed first into one hopper and then into the other. The wing nut and bolt in the slot at the lower end of shaft *M* are adjusted to regulate the throw of the flipper. The entire driving mechanism is supported by a frame made of angle iron which is riveted to the box *A*.

After the device is assembled, the box and chutes are bolted to the timbers which support the condenser, and in such a position that the cotton dropping from the condenser drops into the middle of the box. Our condenser is so located that it is equidistant from both breakers, and so that the chutes feed into the side of the hoppers about 12 inches from the back end of the hopper.

I have not given the numbers of teeth in the gears, as these can be arranged to suit local conditions. We used what was available in the scrap pile.

It isn't necessary for the flipper to work oftener than once or twice per minute. We happened to have a combination of gears and pulleys that gives us about five changes per minute. Of course, the oftener it changes, the better the mixing of cotton secured, and the nearer a constant quantity of cotton is kept in both hoppers.

I believe it will be an easy matter for the mill master mechanic to construct one of these feeders. It, of course, is applicable only to two-breaker installations.

In case the mill wished to operate the feed by hand, a handle could be substituted for the mechanical drive, but this is very simple, and does not require even the part-time attention of a man back of the breakers, allowing him to do other work about the picker room. BOB (GA.)

Separation of Sateen Threads.

EDITOR COTTON:

Any of your readers having trouble with sateen threads sticking together on the slasher may be interested in the following description of some ways we have used to overcome this difficulty.

In one large concern, where it was my good fortune to be for some time a few years ago, this trouble came up, and it was remedied for the most part, or rather reduced to the minimum, by having the yarn separated after passing the cylinders by using larger separators than are commonly used on slashers. The size was dosed with turpentine and the two together had a very desirable effect for the better.

Some time afterward I caught on to another idea by seeing a lease taken in another mill on slashers so as to keep the colors up while weaving, where the weaver could get at them on an even number of beams with the proper number of threads on each—turpentine to be used in the starch in sufficient quantity for good working. One-half of the yarn was separated by placing a lease between it before passing into the size just before the beam was full of yarn to be left in until the warp was placed, then an eight-square rod, one inch and a half in diameter, of the proper length, properly shellacked or varnished at will, was used to take the place of the lease string and allowed to remain in until the warp was woven or finished and to be kept pretty well back; then common sense must be used as always.

If my memory serves me right, I put the first or round rod into a shade of yarn with the second and fourth harnesses down; and for the flat or second rod, second and fourth harnesses up with the first, third and fifth harnesses down. I have run sateen in this manner—first and second down, third and fourth and fifth up for the first rod; and for the second (flat) rod, first and second up, and third and fourth and fifth down.

In some localities, five-shaded work is woven with the largest roll in front, and the grade running down to the back harness. With this exception the back roll is reversed (they say) so as to keep the back harness up a little higher than the fourth. On this point I always disagreed with them, as it was contrary to all common sense.

Now you may ask, how shall I get the lease string that divides the half of the warp by the separators and be able to separate my yarn at the same separators as it was before this? This lease string passed down onto the beam just ahead of the cut mark. The strings must be put in again as before, just back of this string, that separates the half of the yarn, and when they come along, the separators are put in as before, and the beam filled. "Oh," says someone, "but that takes too much trouble and time." Please remember that anything that is worth doing is worth doing well, and that which is well done is twice done.

Now as to the cause of threads sticking together, the amount of yarn required for sateens, anywhere from 3,600 to 5,500 threads, puts the cylinder of a slasher beyond its capacity of drying properly, more especially if exhaust steam is used, and it is often the case that no two lots of starch, of whatever kind, contain the same amount of gluten. Take potato starch, for instance; starch that has been made from potatoes that have been chilled, not actually frozen, will not give as good results as will potatoes that have not been chilled. Starchmakers say that starch is starch; that heat and cold do not affect a potato to the detriment of the starch. Ask your wife if starch made for home use is allowed to stand over in a cold night for use the next day, and is frozen, whether they can get as good results as from the day before freezing? Neither is size made from starch in a dry state as strong for sizing yarn as that which has fermented, having stood, say, for three months. The penetrating action of some size which is feremented, I might say, is much stronger and a less quantity will answer for yarn than unfermented starch of the same quality; as the latter is largely on the outside, though this applies chiefly to flours. W. B. (MAINE)

Card Setting by Gauge.

EDITOR COTTON:

I read in the November issue of COTTON the practical letter by "B. A. B. (N. C.)" on the subject of a loose or a tight gauge. Now I will agree with "B. A. B." in some respects, but in some others I cannot. He says you can't pick up a man just any day and put him in charge of your cards and expect him to set them right. I will agree with him on this.

I also agree with him in what he says about making a card grinder overnight, and will also agree with him in what he says about its taking years of study and practice to set cards as they should be set. Also I think he is right in his statement that when a mill gets a good card grinder he should be paid enough to keep him.

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Now, coming to what "B. A. B." says about a loose or a tight gauge. He says you have the gauges to go by and why not go by them. This reminds me of a man who came in a mill where I was once working as second hand in the card room and said he was a card grinder. He was hired to grind cards as they were in need of a grinder. He went to work after getting his card dusted out, and grinder rolls put on and set. He began to get ready to set the flats on the card that had just been ground and I was to show him our methods of setting, like I would any new grinder who had just come in. He got angry and said he had been grinding for thirty years, had his gauges to go by and knew what he was doing. He was allowed to go ahead with his methods and he faced the flats on every card in the room.

Also, I once heard a man, just an ordinary fly frame fixer who had never ground cards a day in his life, say that a card grinder could not miss setting them right if he had gauges to go by.

I will disagree with "B. A. B." about using card gauges. The first thing the grinder has to be possessed with is one of the five human senses—the sense of touch, or feeling. By the sense of feeling the amount of resistance there is on the card gauge when you are pulling it between the wire of the cylinder and flats or between any parts of the card that you are setting. This is something that can't be learned out of a book. It takes actual practice, and a good bit of it to get good results.

"B. A. B.'s" methods might work on new cards, but they won't work on old cards. For instance, a card which has been running for a long time and has gotten some oil on the clothing, oil that has run out of the cylinder bearings, and the clothing has become spongy or loose, you can't set to a tight gauge; if you do, when cotton has been put in the card the wire gets under the strain of carding the wire will straighten out just a little and will face. This setting is known as loose setting. Now if the clothing is not loose or spongy and no tail end laps or hard substances have been run in the card and mashed up your screens and mashed down wire on the cylinder and everything about the card is perfectly smooth, you can set to a tight gauge, if your cards are on a good floor. I prefer the ground floor for my cards.

Now in closing will say if cards have been running a long time and a new grinder is hired, he will have to grind around one time before he can get good results, for he will have to learn the condition that every card is in so he will know how to set them.

A. L. (N. C.)

Drawing and Fly Frame Clearers.

EDITOR COTTON:

I am experiencing trouble in trying to find an adequate clearer or clearers, I should say, for drawing and fly frames. Having tried several different kinds with no great success, I would very much appreciate it if some of COTTON'S readers would help me out on the subject. I would like to have their opinions as to what is the best under-clearer for drawing and for the slubber. I have self-weighted rolls on the roving frames and would like to get a good revolving top clearer also, or a good stationary or revolving underclearer on the roving machines.

W. O. R. (MASS.)

Points on Sliver and Ribbon Lap Machines.

EDITOR COTTON:

Having read Mr. Soniaman's article in the September issue, an installment of his series "What Other Men Manage With," I am going to give my opinion on some of the questions asked therein. I might say in passing that I feel it would be interesting for other mill men to give their answers to these questions Mr. Soniaman is propounding, as they are directly pertinent to the work of us all.

In the September installment, Mr. Soniaman gives two or three methods for marking cans in order to distinguish carded from combed work. One of the best methods for this purpose that I have seen was designed originally for preventing waste, and yet it can be applied to this use. It is to have a hoop band of fiber about 1½ inches wide attached to the top of all card, comber and drawing cans, so that when the hoop is let down, it will circle half the circumference of the can; as soon as a can is doffed on a card the band is brought over the top of the sliver, instead of pushing the sliver down inside the can, straining the fibers and crumpling the two top layers. In a great many cases, the lap machine tenders cannot find the end of a sliver and break a couple of yards off, not much, but it mounts up. I think the readers will agree with me that the expense of putting bands on the cans will be more than repaid. If carded and combed work is run, the bands can be painted on either of the two sets, or just about a 2-inch stripe made in the center of the band. This then can be easily sandpapered off, should the mill go onto all carded or all combed work.

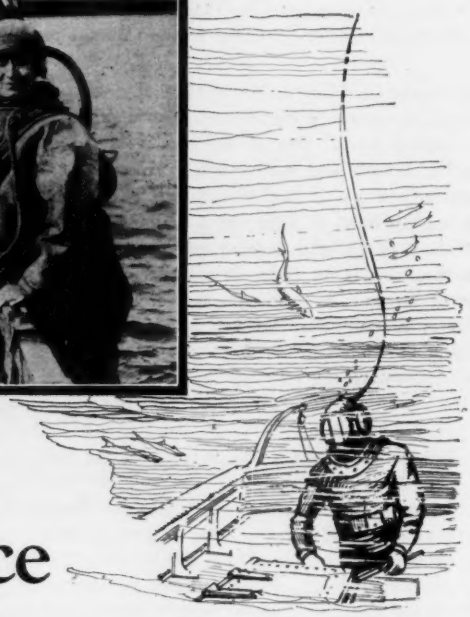
Going further into Mr. Soniaman's article, I consider sliver lap machines with the table and mechanical stop-motions the best practice. Then when a sliver breaks or a can runs out, the broken sliver or new sliver can be fed up to the tail-end of the one on the table. Also, if the sliver spoons are working accurately they will stop the machine when any light sliver comes along. This cannot always be said of the electrical stop motion, unless the sliver is extremely light, for if the sliver is thick enough to stop the rolls from touching or connecting, the machine will not stop.

All lap machine operatives should be instructed to notify the section man if any single preventor or full lap stop motion is not working accurately; also to remove all light card sliver, such as that caused by split laps and feeding sliver too soon after stripping, also this same sliver should be returned to the cards to be checked, as to the cards. Ribbon machine operatives should be instructed not to allow any great length of single to pass into the lap, by reason of a roller lap, one of the ribbon webs breaking down, or a machine not stopping immediately after a lap has run out; regardless of the size of the lap, it should be taken out and the single removed before that lap is set on a comber creel. It is nice to go on a comber section and see all the laps on the creel the same size and neat, with the tips of the lap end hanging down or sticking out from the creel rod about an inch in length, but it is nicer to know the yarn is even and have a few pieces or small laps on the creels.

Comber tenders should be instructed to take out any single laps and return them to the ribbon tender. If the laps of each machine are numbered with different colored crayon or chalk by the lap tender, then it is easy to trace where the single or bad laps are coming from. The waste made on each process and by each operative should be checked. If, for example, there are six sets of combers, paint a two-inch band—as Mr. Soniaman suggests—near the top of six cans, the band on each can being a different but distinct color for each comber tender; then three cans painted in the same way for the ribbon machines, and for this any of the six colors used for the combers will do, with a two-inch stripe of another color run across to avoid confusion. The three can colors for the sliver lap machine can be the same as the ribbon lap, but without the stripe across. There is no danger of getting these three cans confused with the comber cans, as the waste from the two processes is easily distinguishable. By adopting this suggestion, and by occasionally supervising the picking up of the waste, one can find out who is putting in the cleaner waste, oily waste, roller laps, etc., and who makes all the waste.

Lap machines equipped with full-lap stop-motions are a help to the operative, for whenever he or she has to leave a machine in case of necessity, when cleaning another machine, looking after the work of another operative who has gone for a drink of water, going after the comber-man, etc., there is no need to worry about the size of the lap or the machine not stopping. On machines not equipped with this motion there are always cases where laps have run and become too large, causing waste and at times a breakage on the machine due to an operative being away from the machines. Regardless of the make or type of machine or whether or not the machine is equipped with full-lap stop-motions, when the full lap is within ¼ inch of reaching the edge of the lap-plate (the edge is the limit) at the back where the sheet of cotton is being wound on the lap, then, in my opinion, the lap is of the right size. If the machine is equipped with a stop-motion, this should be set to act at that point, because the lap, or the outer layers, will spread as the lap plate is not large enough at this point to make them firm like the rest of the diameter of the lap that is kept in position by the lap plates. For instance, note a large lap that is higher than the plates, and when that lap is taken out, the outer layer often will be wider than the layers that were below the lap plates. Many times the lap will fall off the wood corrugated rolls of the ribbon machine, or the finger guides will bind the lap, sometimes breaking it back. The lap machine tender tries to force it between the guides that are set for a good lap, and forces the edge of the lap off and causes two or three layers to be taken off, or runs it until the lap is even. The result is either waste or uneven ribbon laps.

When sizing, I would suggest that all changes be made on the ribbon lap machines, and that these be sized twice daily, morning and afternoon, say at 10:00 A.M. and 3:00 P.M. A record should be kept of the sizings, and if the man in charge of the combers does not do this work himself, he should keep a good eye on these records to see if there is any machine which needs changing more than the others, for there are other things than the draft gear that cause the laps to show variations. It does no harm to watch the sizings of a machine that has been overhauled and scoured, and compare these with the sizings made prior to overhauling, also to notice the webs coming over



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the curls, to see whether they are more even. Putting in a complete new set of leather rolls or newly varnished rolls after overhauling may help; perhaps the webs will show the rolls need changing.

A good place to put laps when the comber creels are full is to have lap trucks made to hold about twelve laps for each ribbon tender to place the laps on instead of on the floor. This saves a lot of labor and waste. When there is room on the comber creels, the truck can be run down to the combers and unloaded and all empty spools carried back on the truck, making one trip instead of twelve and making the job more comfortable and easier for the lap-tender, as well as saving a lot of injuries. Carrying six or seven hard wood spools, one can easily drop one, and many a time one or two toes have been broken as a result.

I prefer having one operative look after either all sliver machines or all ribbon lap machines, when the machines are laid out in pairs, as the operative can take a position between the two and watch both machines at the same time. Whereas if operating one sliver and one ribbon machine, not facing or not side by side, he cannot watch them and keep them running as efficiently.

In feeding a new sliver lap into a ribbon machine there sometimes are thick places and lumps coming through where the two ends of laps were pieced. It is done at times by the best of operatives, regardless of the training. In picking those lumps out of the web, the web gets broken—hence a little waste and singles. A good way to overcome a great deal of this is to train the machine tenders, when putting in a new lap, to lay the tips of the lap about one inch over the tail-end of the lap that is about to run out. Then when the machine is started and the lumps come through the rolls where the piecing was made, they can be picked off of the web practically without breaking it, because the lumps are on the top, whereas they would be underneath if the piecing were made the other way.

Lap machine tenders should be instructed to look out for cat-tails caused through rough places where the cotton passes over the lap machines. (These also are found on the comber, but I will leave that for a future letter.) Some fibers of the sliver running around the ear brackets on the sliver tables catch on a rough or sharp spot at the bottom of the bracket and accumulate more, and the slivers sort of pull it until one end is loose and soft and the other end is sort of hard, more condensed and tapered to a point. (Some people may call these slugs.) Those cat-tails, if not removed, lose their grip and into the lap they go. Some may never get by the comber, but if they do, there is a better chance of their getting past the other processes, and I think they are helped when twist is put into the cotton. I have purposely let some of these cat-tails go into the lap. The majority, after going through the ribbon machine, were pretty nearly in the same state as when they went through the sliver machine—the hard end of them was not stretched a bit. Then I watched them go through the comber—some were broken up by the half-lap and lap comb, and others got through but were stretched some. But what was left of them was sufficient to cause a slug in the yarn after getting by the former processes.

Another place where they gather is on a sliver lapper without a table at the back; that is, at the bottom of the slots in the tin guides, where they all travel before reaching the drawing rolls. Suppose those readers who have lap machines, just for the sake of curiosity, go out and break off all the slivers at the back and run the tail-ends through and look at the bare table or the slots in the tin guide and see how many cat-tails there are. I don't think many will have looked in vain. Even where the tables are nickel-plated, the nickel chips off and leaves places for the fibers to catch.

The cat-tails which are made on the ribbon machine (although they are not as hard and condensed as those from the sliver lappers) are made at the two small guides that guide the lap to the back roll; also at the bottom of the curl where it fits into the lug brackets. These things should be looked after and the same attention given to the lap machines when looking them over as to the combers.

The comber man should inspect all the gears and see that they are greased systematically like the oiling. He should watch for gears grinding away through lack of grease, and see that all carrier gears are running square and true and not too deep in mesh or deeper on one side than the other, due to the gear stud bracket not being square and true. I have known fellows to leave a carrier gear too deep or not deep enough in mesh, because when tightening the gear stud, it would slip up or down. A good way to overcome this is to double some paper up half the width of the gear and as thick as necessary to suit the amount of play needed, and run the paper between the gears, then push the gears into mesh and tighten the stud and take out the paper. There is many a good gear ruined through leaving it too deep or not deep enough in mesh.

I am sending herewith a table showing how we record our sizings and draft gears on the ribbon machine, so that I can tell what draft gears are on every ribbon frame without going to the machines to find out. As soon as the sizing is finished and any ribbon machine needs changing, the gear table is consulted to find what draft gear is on and what is wanted to produce the desired results. Then a slip of paper carrying the numbers of the machines and the gears to be changed is given to the third hand. This method saves time and labor and loss of production by stopping the machine to find what gear is on. In connection with the table I might state that our standard weight per yard is 615 grains with an alloawnce of five grains either way, giving us a range between 610 to 620 to work in.

The readers will readily observe how simple and easy these tables are to read. They will note also that the back roller gear is changed instead of the draft gear.

Using the two tables together (they being taken for the same week) Ribbon Machines 1, 2, 3 and 4 were light on Monday A.M. and a 56-tooth gear had been used on the Friday previous on all these machines. (The gears on Friday are shown to indicate what gears were on before changing on Monday.) So the table shows a 55-tooth gear was put on because the sizing was light. Another instance: No. 6 machine on Wednesday P.M. weighed heavy (628 grains) with a 55-tooth gear on. So a 56-tooth gear was put on which made 618 grains, so on Thursday A.M. No. 6 machine showed light (600 grains) and so the 55-tooth gear was put on again, which produced 615 grains.

I would like to write a few words about instructing or teaching the help the right way to do things. In showing an operative how to make the slivers meet on the sliver machines, in putting the end of the lap over the empty spool, in putting a new lap in the ribbon machine, etc., after showing the correct way, then I show them the wrong

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RIBBON LAP MACHINE SIZINGS FOR WEEK ENDING NOVEMBER 1, 1924

Machine No.	Weight Changed to—	Machine No.	Weight Changed to—
	Monday 9:00 A.M.		**Monday 3:00 P.M.**
1	600 gr. 610 gr.	1	615 gr.
2	603 gr. 612 gr.	2	619 gr.
3	600 gr. 615 gr.	3	620 gr.
4	601 gr. 614 gr.	4	612 gr.
5	620 gr.	5	616 gr.
6	619 gr.	6	615 gr.
7	610 gr.	7	610 gr.
	Tuesday 9:00 A.M.		**Tuesday 3:00 P.M.**
1	613 gr.	1	615 gr.
2	613 gr.	2	617 gr.
3	617 gr.	3	617 gr.
4	620 gr.	4	618 gr.
5	625 gr. 618 gr.	5	612 gr.
6	612 gr.	6	617 gr.
7	598 gr. 614 gr.	7	612 gr.
	Wednesday 9:00 A.M.		**Wednesday 3:00 P.M.**
1	619 gr.	1	611 gr.
2	618 gr.	2	610 gr.
3	610 gr.	3	611 gr.
4	618 gr.	4	619 gr.
5	611 gr.	5	612 gr.
6	610 gr.	6	628 gr. 618 gr.
7	611 gr.	7	610 gr.
	Thursday 9:00 A.M.		**Thursday 3:00 P.M.**
1	610 gr.	1	619 gr.
2	613 gr.	2	613 gr.
3	625 gr. 612 gr.	3	617 gr.
4	618 gr.	4	620 gr.
5	618 gr.	5	619 gr.
6	600 gr. 615 gr.	6	620 gr.
7	612 gr.	7	619 gr.
	Friday 9:00 A.M.		**Friday 3:00 P.M.**
1	613 gr.	1	617 gr.
2	617 gr.	2	620 gr.
3	612 gr.	3	613 gr.
4	610 gr.	4	620 gr.
5	612 gr.	5	610 gr.
6	611 gr.	6	618 gr.
7	616 gr.	7	620 gr.

BACK ROLLER ON RIBBON MACHINES
Changes Week Ending Nov. 1st, 1924

Mach. No.	Friday's Gears. (Teeth)	Monday A.M. (Teeth)	Monday P.M. (Teeth)	Tuesday A.M. (Teeth)	Tuesday P.M. (Teeth)	Wed'day A.M. (Teeth)	Wed'day P.M. (Teeth)	Thursday A.M. (Teeth)	Thursday P.M. (Teeth)	Friday A.M. (Teeth)	Friday P.M. (Teeth)
1	56	55	55	55	55	55	55	55	55	55	55
2	56	55	55	55	55	55	55	55	55	55	55
3	56	55	55	55	55	55	55	56	56	56	56
4	56	55	55	55	55	55	55	55	55	55	55
5	55	55	55	56	56	56	56	56	56	56	56
6	55	55	55	55	55	55	56	55	55	55	55
7	55	57	57	56	56	56	56	56	56	56	56

way and the bad effects resulting therefrom. I find the help will not forget the negative illustration and they will learn things quicker, for it is contrasting the right with the wrong. Many will say the help learn quick enough how to do the wrong thing without showing them, but I have found that it has helped greatly, for then they do not have an excuse for saying, "I did not know it would do thus-and-so."

I would like to write more in answer to some of Mr. Soniaman's interesting questions, but I will leave it until a later issue, as I think this letter is now long enough for one issue. JOCK (MASS.)

Identifying Causes of Speeder Smashes.

EDITOR COTTON:

In the December, 1924, issue of COTTON "G. S. (N. Y.)" asks for some information as to just what constitutes the duties of a third hand on speeders. Also how smashers can be detected and their apparent cause.

The general duties of a third hand are as follows:

His most important duty is, essentially, repairing the speeders. He must also supervise the room in a general way. That is, see that the floors are kept clean and the main alleys are kept clear of trucks, etc. Also he must see to it that all cleaning and oiling is done regularly and systematically.

In most mills the custom is to post a notice in some conspicuous place, giving instructions to the help as to how often they must sweep out the alleys, pick the clearers, oil and clean the rollers, clean the frame backs, head and gears, etc. It is up to the third hand to see that these instructions are carried out to the letter.

A good third hand will lay particular emphasis on the oiling, as a speeder, when well oiled, will seldom give trouble, and breakage of castings and general replacements due to wear and tear can be cut at least 50 per cent where the speeders are oiled properly.

The frame tenders oil their own machine spindles and in most cases they use about four times as much oil as is required. Many tenders point the oil can spout at the top of the spindle and squirt, (More oil gets on the casings than is put on the spindles) their idea being to oil the spindle notch where the flyer pin fits and allow the excess oil to run down into the bolster. This method saves the frame tenders a great deal of time and trouble, but it is a very careless and slipshod way of doing things. The proper way would be to oil the bolster top carefully and then go over the spindle tops, wiping them with a piece of oily waste. It is up to the third hand to teach them this method and then see that they follow instructions. (If the spindle tops are not oiled, they will in time wear and the flyer fit poorly. In some poorly managed mills, the spindle tops are so badly worn that it is necessary to drive the flyer tight with a wooden mallet and remove it with a short brass bar.)

The third hand should be tactful and use diplomacy, as he will be called upon quite often to settle disputes that arise between the operatives over empty bobbins, doffing trucks, roving, etc. It is his first experience as a handler of help. It must be remembered that although most disputes are very trivial affairs, in the eyes of the operatives they are serious matters and should seemingly be settled with all the solemnity of a Supreme Court.

Most mills leave the distribution of supplies to the third hand. He should never give out new brushes, brooms, etc., at random, but inspect the old ones, and if they seem to have a fair amount of useful life left in them, have the tenders use them a while longer. Never give new supplies unless the tender surrenders the old ones. He should be as conscientious with the mill's property as though the cost were coming from his own pocket.

Whenever difficulties arise between the help, he shouldn't be too hasty, but take time to hear both versions of the story before taking any action. He should try to be fair and square in every instance, and above all, not show partiality or he will soon have a room full of discontented help on his hands.

Once an order is given he must see it through, for if the help should detect any signs of weakness in him they will make life unbearable. Now and then one finds a tender who is very obstinate and hard to manage, but fortunately the big majority are easily handled, once one becomes familiar with their ways. The foregoing should suffice on room management.

It might be well to give a few points on oiling and cleaning:

Oiling:

Head ends and all fast motions—Once a day.

Slow motions—once a week.

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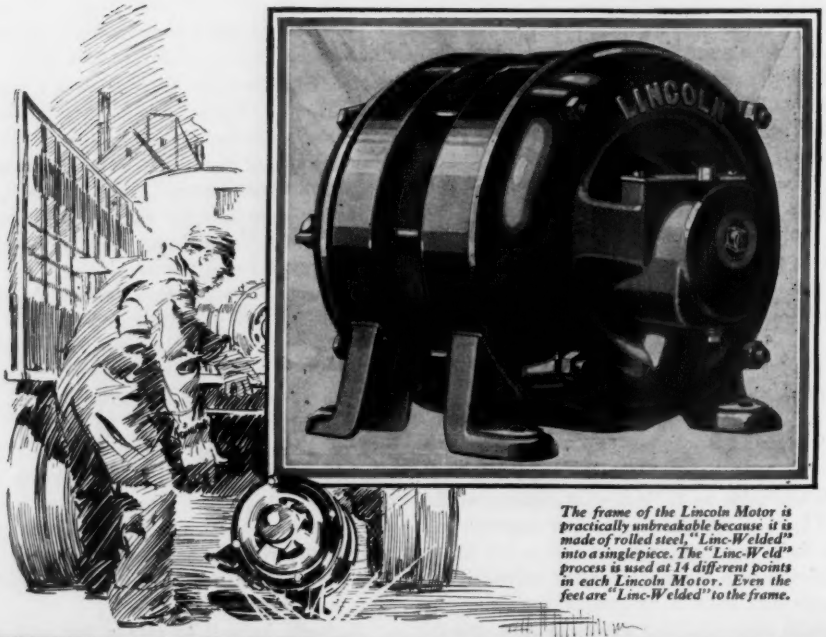

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Spindle tops wiped with oily waste first doff every day.

Bolsters and bobbin gears—first doff every day.

Spindle tops—oiled once a month.

Bearings for spindles and bobbin shafts should be greased when frames are scoured.

Cleaning:

The frame should be wiped down on Wednesday and cleaned thoroughly on Saturday.

The flyers on slubbers and second intermediates should be wiped every doff.

Flyers on roving and fine frames should be wiped twice each doff.

Roller beams on slubbers should be cleaned twice a day.

Roller beams on intermediates and roving frames wiped every doff, also at quitting time.

Frames should be brushed down twice a day.

Casings brushed down every doff on roving and fine frames.

Spindles cleaned at least three times a week.

Spindle and bobbin gear shafts should be cleaned every three months.

Drawing rolls should be scoured every three or four months.

Top rolls should be cleaned every day on fine work and three times a week on medium work.

Top clearers should be picked often enough to keep them free from waste.

Spindles on the roving frame should be taken out once a year, and the bolsters cleaned out thoroughly and filled with clean oil. At the same time the frame should be levelled, spindles set, and all flyers balanced.

Of course these rules aren't necessarily arbitrary, but may be modified to suit local conditions, such as hank roving made and nature of the finished product.

Fine counts generally require that the frames be given much more attention than would be necessary for yarn going into flour bags, or some such product.

The third hand generally has charge of the roller closet also. Some mills allow a certain number of rollers per frame each week, while others leave it to the discretion of the third hand as to when a roller is sufficiently worn to warrant replacement. The latter method is preferable in my estimation, providing the third hand is a good man and onto his job.

Smashes:

It is not difficult to analyze a smash on a speeder, once you become a little familiar with the machine. As a general rule smashes consist of four distinct types.

1—The ends curling up around flyer tops;

2—Running over or under the taper of the bobbin;

3—Ends twisting off at front rolls, also known as cut roving;

4—Building a bunch on the bobbin.

Ordinarily speaking, these four forms of smashes can be caused by a large variety of breakdowns. Nearly always, however, the cause is of the most simple form, and once located, can be remedied in a very short time. Only rarely does a very serious breakdown occur on a speeder.

We will consider complaint No. 1 first. That of the ends curling around the flyer top.

This can always be looked for somewhere between the bottom cone and the train of gears forming the bobbin drive. We would look for the trouble as indicated below:

1—See if the cone belt is broken.

2—Notice whether the intermediate gear connected to the bottom cone gear is broken or has jumped out of mesh. Also the key on the bottom cone gear might be sheared off, although it is very unusual to have a key sheared.

3—Waste might be jammed in any one of the gears in the train through to the bobbin drive. Sometimes a very small bunch of waste is sufficient to cause trouble.

4—A bobbin or other object might become lodged under the bottom cone, raising it slightly, causing the belt to slip.

5—Cone belt may be stretched so that the cone will touch the floor.

In some mills, if a cone belt stretches so much that it becomes useless on the fine frames, it is taken off and later used on the intermediates. I fail to see where an economy is effected, as when a belt is so stretched the greatest part of its life has been exhausted and it doesn't seem practical to use it on a heavier machine where it is subjected to even harder wear.

6—Broken teeth in the gear train will also cause a smash, although this is a very unusual accident.

7—Cotton now and then will find its way into the bottom cone bearings. This is apt to cause slack ends rather than what is commonly termed a smash. More often than not, considerable trouble is caused before the cotton is located and removed.

8—Occasionally the gear driving the sun gear (on certain makes) becomes worn, causing the sun gear to skip. This causes the ends to slacken and tighten alternately, until the trouble is remedied.

9—If the rail is running hard, it will cause the bottom cone to slip and the ends will curl up at the flyer tops. This is sometimes quite troublesome to locate.

10—The couplings on the spindle and bobbin shafts sometimes become loose, and the end will curl up on just a section of the frame. When these couplings are tightened care should be exercised to drive the shaft back in place so that the gears on the shaft are properly in mesh with the bobbin or spindle gears.

The second type of smash, that of having the ends running over or under the bobbin, is caused by some of the following faults, which in nearly every case, also prevents the dog from changing.

1—The rack being stuck.

A large number of minor troubles will cause the rack to stick, such as waste jammed in the rack teeth, or in the rack gear teeth. Also waste jammed in the rack slides.

The tension gear being set too deep will also stick the rack. If for any reason the tension gear becomes loosened and falls out of mesh the rack will remain stationary. The ends will tighten gradually, and if not detected, they will very soon result in a smash.

2—Knock-off release clutch slipping.

3—Builder screw gear being jammed with waste, will prevent jaws of builder from closing, causing ends to run over or under.

Building a bunch on the bobbin is the next thing to consider.

1—The rail binding is the most common cause of bunch building. In fact, I don't believe there could be any other cause for it.

If the bunches were on only a certain number of bob-

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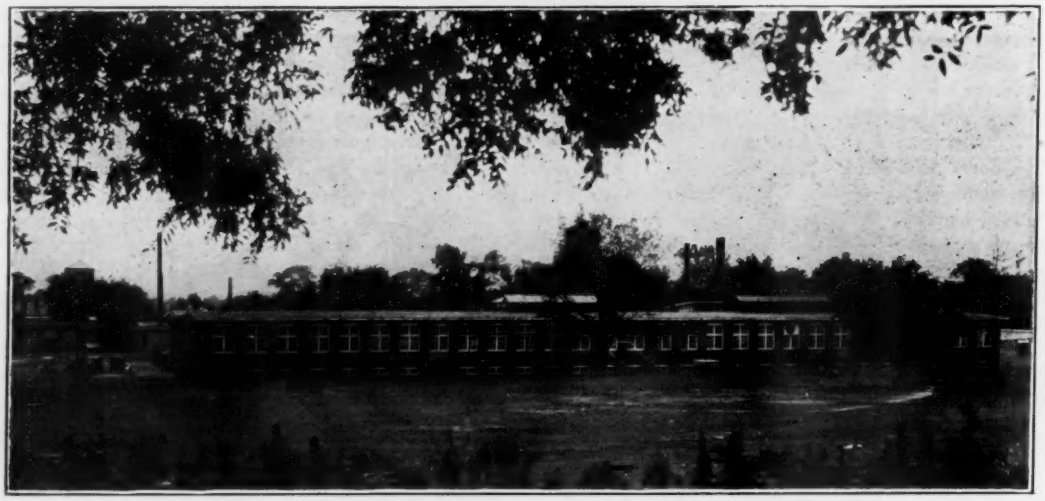

View of first completed portion of our new branch at Cedartown, Ga., opened in January, 1924.

This plant is particularly well situated and equipped to handle Sulphur-Dyed Twills, Drills, Ducks and Sheetings for the work-clothing trade.

bins, it would indicate that only a portion of the rail were binding. Most likely in this case some object would be lodged between one of the lift racks and gear. Waste might be jammed in one of the slides, also.

If all the bobbins showed a bunch, it might be caused by a lack of grease on the slides, lay gear out of mesh, or some one of the train of gears from the lay gear to the bobbin rail broken or jammed with waste. Very often waste will collect in the lay gear, as it is so close to the floor.

The twin gear will fail to act sometimes, through worn teeth, etc., and this will build a bunch on the bobbin.

The next and last common form of smash is where the ends have been twisted off, or cut at the rollers.

If the twist gear should become loose and drop out of mesh, the rolls would cease to revolve. The ends would twist up and break off at the rolls.

Cut roving would also be caused by the draft gear becoming loose or being out of mesh.

The carrier from the second to third lines of rollers will sometimes fail to seat properly when changing over, and if not tried before starting up, all the ends will be broken down.

To sum the whole thing up, there are just three motions on the speeder.

1—The winding motion.

2—The twisting motion.

3—The drawing rolls.

When these have become familiar to a speeder man he has mastered practically everything about a roving frame.

I may have strayed from my subject to some extent in places, but I hope the information contained in my contribution will prove of some use to a few readers who haven't quite used up all their gray matter to figure out "Cone Outline" and "Bobbin Lead vs. Flyer Lead."

C. C. (N. J.)

A Suggestion on Filling Wind.

EDITOR COTTON:

There is one point in connection with running filling wind for warp, and in running the traverse on spinning up fast or down fast that may not be understood by everyone, and so I am passing along the following suggestion that has been of material help to me:

In making filling yarn for weaving, the traverse on spinning should be run up slow and down fast. This is because 66 inches of thread are bound on, so to speak, with 22 inches, on account of the 3 to 1 arrangement of the cams. This prevents the yarn from either kinking or sloughing off in the shuttle due to the tremendous shock of the picker knocking the shuttle across the lay.

But in spinning filling wind for warp yarn, it is better to run the rail up fast and down slow. Where there is a steady pull on the yarn, as at the spooler, there is no shock to slough the yarn off, or kink it, and of course the spinning runs better by this method, and a heavier traveler can be run by having the rail go up fast and down slow.

On filling for weaving, if the rail goes up fast and down slow, since the doffer waits until the rail starts to go down before doffing, this means that the 66 inches of yarn are on the outside, and this has to be pulled off before the weaver puts it in the battery. This of course takes time and makes unnecessary waste.

When the rail runs up slow and down fast it is better to use a lighter traveler because it binds the yarn on.

J. N. B. (GA.)

Why Does this Yarn Stick on the Slasher?

EDITOR COTTON:

I am having trouble with my yarn wanting to stick to the large cylinder on the slasher when it leaves the large cylinder to go around the small cylinder, causing undue strain on the yarn and causing laps on the large cylinder, which is also coated with small particles of short lint or neps causing the yarn to hang worse on the cylinder.

I am running 20s yarn and having this trouble with it, using a thin boiling starch, with 2,000 to 2,500 ends to a set. I am slashing 60 yards per minute, and using from seven to eleven pounds steam pressure. The yarn doesn't stick to the small cylinder, only to the large one.

I don't have this trouble on my 30s yarn.

Y. W. (S. C.)

Why Yarn Breaks at the Spoolers.

EDITOR COTTON:

Replying to the question of "C. and S. (Ga.)" on what causes his thread to break down on the spooler, I would suggest that he change the weight of the lap from 17¾ ounce to a 14½-ounce lap and proportion his drafts not to exceed six inches on speeders and eight inches on spinning. If his cards are doing good work his yarn should spool okeh.

SPINNER (MASS.)

EDITOR COTTON:

After reading the question of "C. and S. (Ga.)" in the January issue of COTTON, as to why his 14½s yarn breaks at the spoolers, and considering his lay-out up to the spooling, I can see nothing wrong except excessive speed at the spooler for his warp wind. He says he runs a spooler cylinder speed of 180 r.p.m. and a spooler spindle speed of 772 r.p.m.

Unfortunately, he does not say at what diameter in the forming of the spool the yarn begins to break. I'll venture to say that with his 6½ x 4½-inch spool, weighing three pounds when full, the breaking commences after the first pound and a half of yarn is wound on the spool. The speed when half full, at a rough estimate, would be about 139 yards per minute. and would increase 100 per cent or to about 278 yards per minute when the spools are full. These figures are based on the spindle speed of 772 r.p.m. given.

As to a way out of the trouble, I would suggest if he has any spare spoolers, to take one or two and cut the speed in half, and when the spools on the higher speed spooler are half full, put them on the low speed spoolers. I believe more production, fewer knots and better work all the way through the mill will result.

I think we'll all agree that when a bare spool is put on, the yarn runs pretty, but slow, and as the diameter increases so does the speed, and certain numbers can stand just so much strain up to a limit.

This question of spooler breakage is not a new one to

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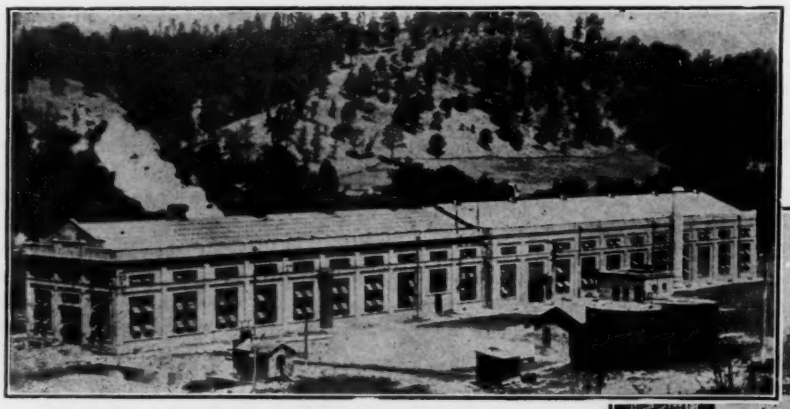

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me. In fact it brings back to my mind how the old English cop winding spoolers were built. Back in those days, all warp yarns, practically, were from mule frames, running from 40s to 200s. These spoolers were built strong, mostly of iron, and well finished. They had a double row of spindles, off-set, the front row having small whirls and the back row having larger whirls, which caused the back row to run at about one-half the speed of the front row of spindles. A good spooler tender would at all times take the front spools when about half full and transfer them to the back row to be completed. Most anyone can see the reason for this. But of course most all of our American spoolers are made with one single row of spindles, with a general speed to take care of all the numbers being made. But I cannot see why a double row American spooler would not be a good thing to think about. I think it would be the real solution to problems like this one. MACK (GA.)

EDITOR COTTON:

I was interested in the question of "C. and S." in the January issue on "Why Does This Yarn Break on the Spoolers?" Frankly, I don't know, but I will give him my own line-up on 13½s warp from the pickers to the spinning. I am making a 13-ounce finisher lap, drafting 90.27 on the cards, making a 55-grain sliver. The beater on the finisher picker makes 1,200 r.p.m., running a 45-inch lap. I have six doublings at both processes of drawing, with about a 5.75 draft at each drawing, and a 61-grain sliver for the finisher drawing. I use metallic rolls on both frames, running 300 r.p.m. front roll on both drawing processes, taking care that my sliver has as good a tension as we can get; and on the cards, as well as the drawing frames, care is taken with regard to cleaning and oiling. The cans are not run too full before doffing, and of course we have standard intervals for grinding, oiling, stripping, setting, etc., according to the sliver.

My card speeds are about the same as those of "C. and S.," cylinder speed 165, doffer 12. On the slubbers I use 4.68 draft with the proper amount of twist to keep the roving from waving and making thin places, making a .64 hank roving. The speeder draft is about 5.96. (These drafts will vary one or two teeth at times, but this is as near a standard as I could give.) The front roll speed on the slubbers is 190 r.p.m., and the same on the speeders, making a 2.00 hank roving and drafting nearly 7.00 on single roving in spinning, with a front roll speed on the warp frames of 150 r.p.m.

Frankly, I think one of the difficulties of "C. and S." is in the weight of his lap, which he gives at 17¾ ounces, and his beater speed of 1,300 is another. His card sliver of 75 grains, drawing 72 grains, slubber draft of 3.75 and .42 hank roving, speeder draft 7.50 making 1.53 hank roving, and spinning draft of 10 making his 14½s, seem all out of proportion with irregular drafting. His spinning front roll speed of 115 r.p.m. on 14½s is what we are getting on some 30s warp yarn we are making. I wonder why he has this line-up. This over-drafting, with poor picking and carding, doesn't give the cotton a chance to draw out evenly. T. A. D. (GA.)

EDITOR COTTON:

This is in answer to "C. and S. (Ga.)" whose 14½s yarn is breaking on the spoolers. I wish first to point out that his work in the preparatory processes is entirely too heavy, and, second, to say that a lighter hank slubber roving without changing the draft would prove beneficial. He has a very good hang-up in both draft and speed, but the work is too heavy. Take the breaker drawing, placing six ends under the back drawing roll, each of which weighs 75 grains to the yard. How this roll holds all the fibers is a question. This roll should hold all fibers, but how can it, when such a large number of fibers exist in the cross-section of the strand? With such a heavy sliver, the back drawing roll is bedded and is unable to do its work. To prove this, let him find the difference between the figured draft and actual draft. Let him try a 12-ounce lap and a card sliver no heavier than 55 grains, and drawing finished sliver should not weigh over 60 grains to the yard.

To me this looks like a case of putting up all full cans at the back of the drawing. I know of no worse evil to cause the work to snap at the spooler, simply because the doublings are not properly carried out. The yarn may size fairly even, but the unevenness is there just the same. Let "C. and S." make the following test: Put up a set of full cans at the back of the drawing and size, and when the cans are nearly empty, size again, and he will get the idea that I am trying to convey. In other words, the same amount of stock runs through the drawing, but the first is heaviest. The cans at every delivery should be one-sixth in size of running out.

Remember in the old days when we ran the railway heads? The railway head, you know, made much defective work, so to overcome this, the railway head cans were painted, each head having its own color, and only one end of each railway head put up to each delivery.

No doubt this gave the best results, and improved the work throughout the mill.

The trouble may be in the thread guide. The thread guide, if the plates are set sufficiently close, will eliminate knots and bunches from passing onto the spool. In many mills, owing to these knots and bunches being a draw-back to good weaving, the spooler guides are set too close. But the best way is to attend to defective work in the preceding processes, and not encourage the closing of the guides. That was the trouble with the old railway head. Each trumpet did not function in the same way; in other words, the friction in the trumpet, or the working or weighting of them, differed, so a longer length of light or heavy sliver resulted more in one head than in another, and when put up at the same delivery, this it was that caused trouble at the spooler. No guides could be set to suit such work. So as stated, the cans were painted and the heads were mixed.

WASH (R. I.)

Sulphate of Chrome.

EDITOR COTTON:

There seems to be a question in the minds of some as to the difference between sulphate of chrome, as made in the dyehouse, out of chrome and sulphuric acid, and the chrome alum when bought as such.

As a matter of fact, there is no difference in practice. A solution of sulphate of chrome that has been used in khaki dyeing to replace the chrome alum may be prepared in the following manner, though chrome alum is better.

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Take 40 pounds of bichromate of soda and dissolve it in eight gallons of boiling water, add seven pints of sulphuric acid to one gallon of cold water and six pints of sulphuric acid to one gallon of cold water. Add both of these to the bichromate of soda in a large stoneware mug, which must be clean and free from previous makings. Take twelve pounds of sugar and add to the solution in the mug a little at a time as the solution will boil rapidly, and it is necessary to keep the solution at a slow boil until all the sugar is added. One pint of this mixture is equal to one pound of chrome alum. The sulphuric acid is mixed in two portions in order to prevent too violent a reaction, with possible injury to the mixer. The acid should be added very gradually to the water.

Each mixing needs to be tested owing to the variations in strength of the iron acetate, but the mixture is something like this: Dissolve chrome alum, one pound to the gallon; bichromate of soda, eight ounces to the gallon; and bluestone eight ounces to the gallon. Reduce the acetate of iron to 25 degrees Tw.

To make up the padding mixture take one gallon chrome alum, one pint bichromate of soda, one gill of bluestone, one pint acetate of iron and mix these when required for use. This is supposed to be chrome alum, and that liquor made from sugar, one pint of the latter (from sugar, etc.) is equal to one pound chrome alum.

After the cloth has been evenly saturated with the padding mixture it is dried evenly. It is of the greatest importance that these goods should never be creased, plaited down, or put in square boxes, as the marks will show if allowed to crease at any part of the process from the grey state to the finishing room. A continuous process is best.

After drying and cooling the cloth, the steaming comes next, and a steaming box or cottage steamer may be used. The steaming has a double purpose. It helps to fix the color on the fiber and it makes the soda penetrate more evenly and more rapidly in the subsequent process. The reasons for using the bichromate of soda and bluestone in the padding solution are three-fold. They help to fix the color on the cloth. They produce the well known chrome brown which prevents the shade from being too much on the buff side, and they avoid the necessity of using too much iron acetate, which makes the cloth harsh in feel and tender in wear.

The steaming is carried out and the cloth is taken to the dye jig, where it is run through a solution of ten pounds of soda crystals in twenty gallons of boiling water. The cloth must pass through this solution at one even speed by running down at one side and laxing up on the other during the first end through. Give four times through the soda and then wash. A pattern should now be taken so that if not exact to shade the padding liquor may be corrected in any direction that may be needed. Chrome alum gives a green tone, acetate of iron a buff tone, and bichromate of soda and bluestone the reddish brown tone.

Other fast shades besides the standard khaki may be produced by varying the proportions in mixing the padding liquor. Next boil in one quart of oleine in twenty gallons of water. Mangle and dry. If the goods are for waterproofing it must be done after mangling.

W. B. (MAINE)

Towels and Toweling.

(*Continued from page* 462.)

drafted over 12 harnesses. This is shown by the weaving plan W in Fig. 87. The draft for the 12 harnesses is shown at X in the same figure, and it will be observed that the threads which weave plain are drawn on the front two harnesses.

The design for the lower sample T, Fig. 85, is given in Fig. 88, and it possibly appears more effective on design paper than it does on the cloth itself. The design is

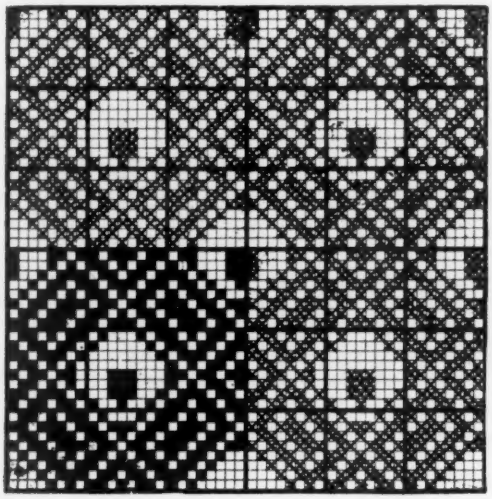

FIG. 88.

complete on 24 threads and 24 picks, and four repeats are shown. The minimum number of harnesses necessary is 13 as shown by the weaving plan U, Fig. 87, and the corresponding draft V in the same figure.

It is doubtful whether the design in Fig. 88 (and the woven product T, Fig. 85) should be regarded as a spot effect, or as a special type of diamond weave. It possesses certain characteristics of both classes, and has been introduced into this particular section, partly as an example of spot design where all the spot effects on any one side of the fabric are similar, and partly to emphasize the necessity in designs for towel fabrics, of obtaining exactly or nearly exactly similar effects on both sides of the fabric.

(*To be continued.*)

A Correction.

EDITOR COTTON:

I notice in my article on "Causes for Stretched Roving," as published in the January issue of COTTON, that the humidity calculations in the fifth paragraph, on page 283, were incorrect. I give you below the correct statement of this calculation:

Dry bulb reading, 60.8 degrees F. 88 per cent of 60.8 or .88 $\times$ 60.8 = 53.50, wet bulb reading. 53.5 $\times$ 13.5 (grams of water per cubic meter when air is fully saturated) = 722.250. 722.250 $\div$ 60.8 = 11.88 grams actual water in air. 11.88 $\div$ 13.5 = 88 per cent relative humidity.

This might have been an error of the printer, or a slip of the pen on my part when submitting it to you.

T. A. A. (S. C.)

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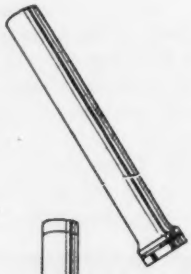

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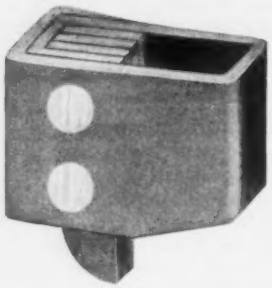

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Belting Butts

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Lace Leather
Valve Leathers
Back Straightenings
Filleting Leather

English Sheep Skins
Persian Sheep Skins
English Roller Bends
English Calf Skins

WRITE FOR BOOKLET 101

Sliver and Ribbon Lap Variation.

EDITOR COTTON:

Referring to the question, "What Causes Variation on Sliver and Ribbon Lap Machines?" which appeared in the January issue of COTTON, I will endeavor to give you an explanation for the cause of variation in laps, that is, from a full lap to, say, a quarter full.

It is a well known fact in cotton mills that there has always been a variation in slivers and laps from a small lap to a large one. This variation, of course, varies on different weights. My experience has always been that on ribbon and sliver lap machines on a full lap it possibly feeds in a little more steadily than it does when it gets smaller. In many mills they have tried the following to overcome this variation:

First, have on the sliver lap machines when starting up, one-half of the cans half full, the remainder full. The same thing also applies to the ribbon lap machines. By taking a can of sliver you will find that it will weigh much heavier at the top of the can than it will at the bottom. I suppose the cause of this is the stretch that it gets pulling from the bottom of the can. In many cases on very fine numbers you will find that the mills run every other can half full which will average up the variation in weights from a full to a partially empty lap or can.

E. A. R. (MASS.)

The Cost of Cleaning Low Grade Cotton.

EDITOR COTTON:

I have made a good many tests during my mill experience as a carder and superintendent and I have never been able to come to the conclusion that it paid to use anything under middling cotton where the finished product had to be free from foreign matter. It is true on low grade ducks and osnaburgs, one can get by with a very low grade cotton providing the pickers and cards are in fairly good condition, but allowance must be made for the wear and tear of the machinery, especially the cards. For instance, the cards have to be ground more, which wears the clothing down and requires re-covering oftener and adds more cost during a few years than would be the case if cleaner cotton were used.

As I have said before, I have made a great many tests, and when I say that I have made them, I mean that I didn't trust to anyone else. When real dirty cotton is to be used in print cloth, sheeting, drills or twills, sold as first quality cloth, it should be cleaned as much as possible before starting it through the opening and picker room machinery. This requires a special machine, and the larger the mill the more machines will be required. To make the test, a suitable day should be chosen, one that is not too damp or too dry. It is also important that the test be completed the same day. Whoever makes the test should be in possession of the warehouse weights of the bale of cotton, as if his weights and the warehouse weights do not agree he will have to include this in his invisible loss if it loses. The ties and buckles should be removed from the bale and weighed carefully. Then the bagging should be removed and every particle of cotton picked off, for a test which is not made properly is as bad as no test at all, in my opinion.

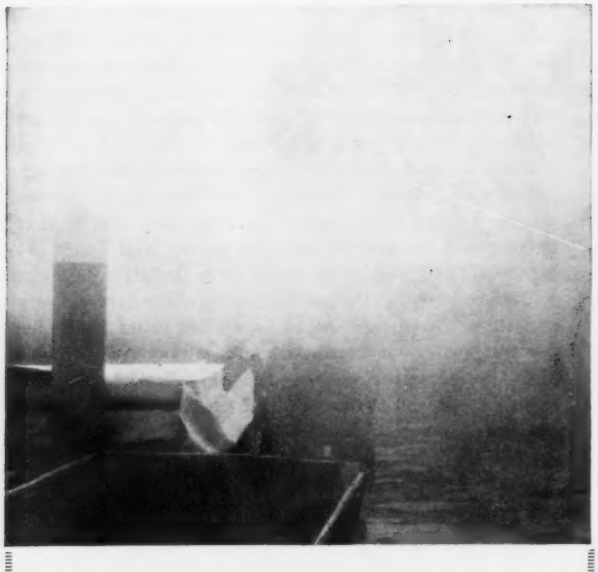
After the cleaning machine has had every bit of lint, dirt and foreign matter, including the motes and the inside of the housing cleaned, the bale of cotton should be torn up properly and run through the cleaning machine the first time. The droppings should all be taken out and weighed, and the machine being thoroughly cleaned the cotton is run through the second time and the droppings weighed. A very accurate scale should be used if accurate results are desired. Now the cotton is weighed to see how much dirt is taken out and the invisible loss before it starts through the regular process. When it starts through the feeders the one making the test should have no other duty until it is completed, as some of the laps or lap ends might get carried off and used, which would make the test misleading.

Before starting the cotton through the feeder every particle of droppings should be cleaned from under the feeders, breakers and inclined trunks if they are connected together. After the cotton is run through they should be cleaned again and the droppings weighed as before, taking great care to get all there is.

The breaker laps and breaker lap ends can be weighed if desired, but I don't do that, as I do not think it is of enough importance to take the time to do it. After getting the cotton into breaker laps, both breaker laps and lap waste should be run through the intermediate. The lap waste should be sprinkled on top of the lap sheet sparingly. But before attempting to make the test on the intermediate, the mote blades or knives should be set so as to chop as little cotton as possible with the dirt, and that which does happen to get through should be picked out and run through the finisher with the intermediate laps. If the bars are too open they will let too much cotton fall through, especially if the fan is running as low as possible to keep the cotton from stopping in front of the beaters. The same applies to the finisher.

Speaking of the speed of the fan, I have often been asked—does a fast fan speed give better results than one that just runs fast enough to keep the cotton from stopping in front of the beater, and as I have made several tests I can say that I have found that the fan must run fast enough, that is, draw enough cubic feet of air through the cages or screens to spread the sheet evenly or bad results will be obtained. There is a happy medium where the best results will be obtained, and there is only one way to find it in my opinion, and that is to try several speeds, weigh the lap by the yard and examine it for thick and thin places. If it is found that the laps are even and not full of thick and thin places the fan is giving proper draft, and after the lap is weighed by the yard and if it does not vary over five per cent, the evener is working very satisfactorily. If the laps vary as much as two ounces in sixteen, the evener belt is hindered in some way or the cotton is not pressed hard enough against the evener roll. The same trouble will cause too many laps to be run over due to the weights being wrong. But this is getting off my subject, even if it benefits some young carder.

After the cotton to be tested has been made into first laps and the laps and white cotton waste weighed and the dirt and foreign matter weighed, I usually take one card and clean it up thoroughly, (usually one that has just been ground and set up properly) and run four laps, which usually requires about a day of ten hours, depending of course upon the speed of the doffer and the draft of the card. After the four laps have been run, I weigh the different waste as follows: Flat strips, cylinder strips, motes,



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including everything in the line of dirt and foreign matter. This requires a very accurate scale and should be done carefully. I do not weigh the cotton or the white waste at the card, but it can be done if a more complete record is desired.

Now if 7/8 to 1-inch cotton is being used with the following settings: breaker beater to feed rolls 1/4 inch to 5/16 inch; mote knives 1/4 to 5/16 inch; intermediate and finisher beater to feed rolls 3/8 to 1/4 inch; to mote knives 3/8 to 1/4 inch. Card settings, doffer to cylinder 7-1000, flats to cylinder 10-1000, licker-in to cylinder 8-1000, mote knives to licker-in 7-1000, feed plate to licker-in 7-1000, front stripping plate 12-1000, back stripping plate 17-1000, licker-in screen 34-1000. Results should be obtained about the same as those that I got, which are as follows:

Picker room test. Grade, low middling.

Gross weight from waste house	450	pounds
Gross weight re-weighed at mill	445	pounds
Invisible loss here	5	pounds
Bagging	12	pounds
Buckles and ties	9	pounds
Dust and motes from cleaning machine	15½	pounds
Dust and motes from cleaning machine second time	13½	pounds
Breaker motes and dust	3½	pounds
Intermediate motes and dust	2½	pounds
Finisher motes and dust	2	pounds
Invisible loss	5	pounds
Total	63	pounds

63 ÷ 450 = 11.77 per cent loss up to finish lap.

In some mills this waste is cleaned as well as possible and together with other waste is made into byproducts such as rope or carpet yarns.

Card test. Laps run, 10. Total net weight, 400 pounds.

Strippings from tops 10½, cylinder, 1½ =	12	pounds
Motes, dirt and lint	8½	pounds
Total	20½	pounds

20.5 ÷ 400 = 5.12 per cent.

Total percentage 11.77 + 5.12 = 16.89 per cent waste made some of which can be sold or reclaimed for byproduct.

Test No. 2. Very dirty, very lowest grade stock.

Gross weight 359. Bagging	13	pounds
Buckle and ties	7	pounds
Motes from cleaning machines	103	pounds
Thread extractor	18	pounds
Feeder	13	pounds
Breaker	9	pounds
Finisher	8	pounds
Invisible loss	18	pounds
Total	189	pounds
Finish laps	164	pounds
Lap waste	6	pounds
Total, including waste	359	pounds

189 ÷ 359 = 52.6 per cent waste.

This bale of cotton was bought for 11 cents per pound when middling cotton was worth 20½ cents. The strips were so low in grade that they had to be put through the cleaning machine mixed with other lint and sold as dirty lint for 1¾ cents per pound and the motes were so bad that they were thrown away.

Test No. 3. 5 bales. 2,425 pounds, middling cotton.

Bagging 68 pounds. Ties and buckles 44 pounds. Total tare	122	pounds
Opener motes	40	pounds
Breaker motes	18	pounds
Intermediate motes	17½	pounds
Finisher motes	16½	pounds
Total	214	pounds

214 ÷ 2,425 = 8.82 per cent.

Card test. 4 laps = 160 pounds.

Strippings 3¾ pounds, motes 2½ pounds = total 6¼ pounds. 6.25 ÷ 160 = 3.90 per cent.

Total per cent of waste, 8.82 + 3.90 = 12.72 per cent.

For a mill to get at the actual worth of a bale of low grade cotton so that the loss can be found, if there is any; i.e., whether it costs more or less, taking everything into consideration, than a bale of middling cotton would cost after all dirt is taken out of the middling cotton, the following must not be overlooked: the pounds you pay for, the pounds you get, the labor spent in cleaning, extra processes and the power consumed, excess moisture which shows invisible loss as each process dries it out. The dirt leaf and foreign matter thrown away. The amount of waste cleaned and sold from both middling and low grade cotton and the price obtained. Also it will be well to keep an account of the actual pounds of the finish lap so that the invisible loss will not be overlooked. Where mills use cotton from middling grades up, and the cotton comes clean regularly, there isn't any need for making many tests during the year. But where a mill uses all grades, a test should be made very often and a record kept for future reference. The cotton purchaser should keep familiar with all the details concerning the loss in waste from low grade cottons and he should be capable of looking at a bale of cotton and deciding if it would be a good investment or not, and be governed accordingly. If he had the proper training he would be prepared to make the seller an offer and therefore make the purchase or turn it down, one or the other, for the interest of the mill.

Using Mixed Staples.

This is another great trouble maker, trying to use cotton with various lengths of staple. There is not a carder or spinner in the world who can take cotton from 3/4 of an inch to 1 1/4-inch staple and get production, much less make even roving and yarns. I was invited to a mill once by the superintendent to help him locate his trouble, and when I went into the mill I found them opening and closing their rolls to make the work even and to make it run properly, but nothing they did helped matters any until we got the extra long staple out of the mix. The superintendent was taking the cotton as the incompetent yard foreman gave it to him and was using it in both warp and filling. I suggested that if he would take the trouble to separate his cotton and use the 3/4 inch to 7/8 inch in the warp and the 1 inch to 1 1/6 inch in the filling and run the extra long on certain machines and put it in the filling, he would get better results throughout the mill. He did this and overcame his trouble.

This sounds like a lot of extra work, but it is not, as I

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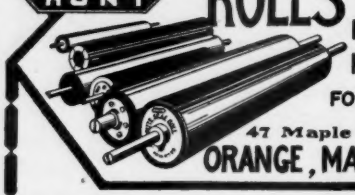

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have done the same thing several times since I have been a carder and a superintendent. I have stapled as high as one hundred bales of cotton in a day and found a good many with staples too long or too short.

The ideal way to keep a check on the staple that is being used daily is for the cotton purchaser to see that the cotton sampler marks the length of the staple on the tag, also the grade. If the actual grade is to be kept a secret, numbers can be substituted, so long as the carder knows what the numbers mean, and the length of staple, so he can keep his rolls set to suit the cotton he is using.

Mixed staples do not show very much at the drawing frames and not so very much at the slubbing machines, as the draft is usually short and the material more bulky than at the intermediates and roving frames (speeders). But at the speeders it is quite different. The roll setting must suit the staple and the draft must not be too great or the results will be uneven roving and bad running work. What I mean by too great a draft is, I don't think the draft should be more than 5.50 to 6.00—better still 5.00.

Setting the Rolls to Suit the Staple.

Take for example, a speeder with front roll 1⅛ inches in diameter and middle roll 1 inch in diameter and as close as you can set them. You have a roll setting about like this:

Front roll, ...1⅛ inch = 9/8 = 18/16
Middle roll .....1 inch = 8/8 = 16/16
Space between front and middle roll ..... = 2/16

Total 36/16

36/16 ÷ 2 = 18/16 = 1 2/16 = 1⅛ from bite to bite. This is too long a bite for ¾-inch cotton, but the rolls cannot be set any closer, and the only way to make first-class even roving is with a very short draft and an even product from the machine that is supplying it. I do not know of any fixed rule for setting rolls, but I find that with fairly even staple I get good results by setting the bite of the roll on the speeder from 3/32 to ⅛ longer than the staple, if the cotton is 1 inch or better, but if it is very short, I get as close as possible, which is all that can be done.

Lining the Top or Leather Rolls.

Knowing what the bite of the bottom rolls should be, the top roll should be set at the proper place to give it. Taking the setting of the steel rolls on a speeder, which is 1⅛ inches when they are as close as they will go, to set the top rolls to match, take a white strip of paper about 1 inch wide and lay it on the steel rolls; lay a piece of carbon paper on top of that and then lay the top rolls on top of the carbon paper, being sure that the paper is straight. Then tap the rolls gently, which makes an impression and will show you if your top rolls are set at the proper distance.

Some General Points.

All the time spent in looking after the cleaning and proper mixing of the cotton, also the proper setting of the rolls to suit the cotton being used is time well spent. I am speaking from experience. First-class results cannot be obtained if the cotton is not mixed properly and put into laps that are clean and free from thick and thin places. If it leaves the picker room right it can usually be kept right, but if not, it never can be made right. The results will be uneven roving and irregular weights, also bad running work, especially if the cards are not sharp and set up properly. A dull, badly set up card will not produce good work from any kind of laps or cotton.

A bale of cotton, when in its normal condition, is said to contain from 7 to 8 per cent of water, and it takes on more or loses it depending of course upon how much moisture is in the air. Very damp cotton should not be used as it will dry out at every process, besides it knots up at the card due to the fact that the cylinder fills up and the result is irregular weights or numbers, poor carding and bad running work throughout the mill.

It often happens that a very good looking bale of cotton can be bought cheaply, due to the fact that it contains cotton varying in length from ¾ inch to probably 1 5/16 of an inch. There are only two things to be done with a bale of this kind, namely, keep it out of the mix or let it go in and make a lot of uneven work and lower the production, and in nine cases out of ten the loss will be much greater than the saving in the price.

A great many mills throughout the country pay very little attention to the way the waste is taken from the different departments and baled and shipped, and thousands of pounds of good cotton leave the mill as waste and the mills lose the difference between the price of that particular waste and good cotton. Take as an example the motes made in the different cleaning machines. Now if they are baled and shipped in the same condition as they are when taken from the machine, the result necessarily, is a great loss to the mill, as in every case there will be more or less good cotton which has fallen into the mote boxes with them. To try to get all the good cotton out by having it picked out by hand is time thrown away, for it could not be done economically. But if a suitable machine is on hand they can be cleaned, baled and sold at a much better price or used in coarse low grade yarns, which might pay even better still.

The good cotton should be picked out of the card and spinning sweeps before being baled, or, better still, keep it off the floor and it won't have to be picked out, as an operator would have to work cheap or pick out and save more than is usually saved for the mill to gain very much from this labor.

It is the little things in each department that need the greatest attention. The sweepers or roving hands can, and do see the large things, but it is up to the overseers and superintendents to make the mill a success, and to do this they must watch the little things, and especially those at the starting of the process, the opening room and picker room machinery and the mixing of the cotton.

ZANO.

"Wash" Comments on the January Issue.

EDITOR COTTON:

In his letter in the January issue of COTTON, "W. G. (Ga.)" gave us a good idea. That is, with reference to running two ends side by side in the drawing rolls in the fly frames, etc. I am exceedingly sorry to have to argue against this idea.

The chief objection is the stretch found on all bobbin-lead fly frames. In such a case, the double strands suggested by "W. G." would be stretched in the same place and of course cause light and heavy work on the spinning. Let

me state right here that it is the doublings that have saved the bobbin-lead system to this day.

Of course, the bobbin-lead is okeh, but as we read the January issue, we learn that Mr. Soniaman calls the cone belt an eternal problem. It is no problem at all, it is a wrong system. "W. O. R." in the January issue tries to smooth the defects of the bobbin-lead, but after reading his letter we are no better off. The stretch is still there.

Next we have a long article from "T. A. A. (S. C.)," who claims that our fly frames are all right, and that the defective work is due to improper care of machines. He seems to know very little about fly frames when he says, "stretched roving can be caused by the poker bar and taper gear collecting waste, causing them to bottom." But what about an American built frame that has no poker bar, but a tumbler shaft instead? However, we will assume that the poker bar and the taper gear are clogged so hard that a crowbar wouldn't move them. Then what? Only two things: The carriage will not change or the ends will run over due to the length of the poker bar which should be shortened a certain distance at every completion of the carriage.

Again, when the poker bar is stuck, in many cases it prevents the springs or weights to function the rocker properly and the latches or latch do not catch on the jaw of the rocker, consequently, the twin gear pinion is unable to function also. But how can this cause stretched work?

Again let us assume that the poker bar is stuck to such an extent as to offer a great amount of resistance to the carriage, this would cause slack, and slackness will not cause stretch.

Next we have "E. B. S. (Canada)" who wants to know how to overcome uneven roving. There are many men in the United States who would like to know the same thing—the writer included. But of course it is not due to the bobbin-lead system.

Enough has been written in this department to enable "E. B. S." to get the best possible results, and the only advice I can give him is to keep on reading COTTON.

"C. C. (N. J.)" gives us nothing new in his article, but he also admits that a tight tension will run considerable before it can be seen and remedied. Again, this is not due to the system; the bobbin-lead is okeh, it only causes a few defects termed unequal conditions.

The trouble in all cotton mills is uneven roving and yarn. I have pointed out that the bobbin-lead frame caused much of this unevenness, but very few people agree with me, and keep on crying for a remedy for stretched or uneven roving.

When a bobbin is nearly full on a bobbin-lead frame, let the reader make the following test: Make a mark at the end of the presser pad and turn the frame by hand. Next, notice how the strand is drawn under the presser pad. Next, picture what really happens when the frame is up to speed, when the pressure at this point is great, and the strand being drawn past this point of pressure. Will the defenders of the bobbin-lead please answer this and tell us what an aid this is to the cone belt?

WASH (R. I.)

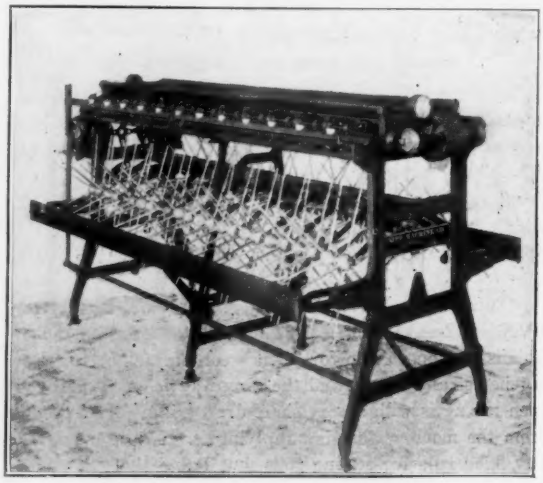
D. ELMORE has become superintendent of the Mutual Mills, Gastonia, N. C., succeeding B. C. Black, it is reported.

GEORGE H. IMES is the superintendent of the new Highland Mills, under construction at Griffin, Ga. He formerly was superintendent of Georgia-Kincaid Mill No. 1, Griffin.

The Sipp Winder for Artificial Silk.

The advent of artificial silk as a permanent factor in textile manufacture has revealed to cotton manufacturers that the winding of cotton and the winding of artificial silk are two entirely different propositions. Oftentimes it is found that the proper equipment for winding cotton would not be adaptable for artificial silk work.

In the accompanying illustration is shown the winder manufactured by the Sipp Machine Co., Paterson, N. J., which the makers state has been improved and adapted particularly for the winding of artificial silk. This type BO winder is of steel pipe frame construction, with patented rigid traverse, and double drive winder spindles—that is, the spindles which carry the bobbins are driven with two pulleys instead of one pulley. The spindle used on this machine is of the type with one head tight on the spindle, the other head screwed on. The form and fit of the



thread is such that these heads are easily screwed onto the spindle, it is pointed out, it only being necessary for the operator to start the bearings, and with a quick spin the head is screwed up to the proper position.

The spindle bracket on this machine is designed so that the spindle which holds the spools or bobbin fits on an inclined plane, making the drive very sensitive, and if the skein becomes tangled or caught in any manner and will not draw off the swift, then the thread draws the spool and spindle back away from the drive pulley, automatically stopping this, and it will remain set in this position until the operator loosens the thread and drops the spindle back in position. The patented rigid traverse is described as a feature, allowing the winding of more silk on the bobbin, it is stated.

GEORGE H. WATTS, overseer of weaving at the Lockwood Company, Waterville, Maine, recently was elected vice-president of a new association formed at Waterville, to be known as the Central Maine Textile Association. The membership of this association is composed of agents, superintendents, overseers and sub-foremen, not only of Waterville, but it is also the intention of the association to include in its membership the same type of operating executives from other textile centers, such as Augusta, Lewiston, Skowhegan, Oakland and Madison.

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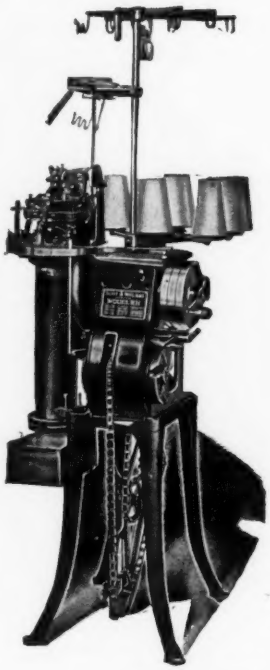

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Each stocking is automatically started upon the empty needles, producing a French welt without drawing thread or cutting, no ends of any kind to be removed.

Machine is fitted with five yarn fingers.

Provision is made for high spliced heel and double sole.

Provision is made for ring top and ring toe.

Needles without rivets or latches.

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Artificial Silk

BY KENNETH MACKENZIE.

As a preliminary to a discussion on artificial silk, it might be well to touch briefly upon mercerized cotton, inasmuch as it was perhaps the first imitation of real silk. The cotton fiber when viewed under the microscope looks like a ribbon somewhat thicker at the edges than at the middle and twisted like a corkscrew. When a cotton yarn or fabric, preferably made from long staple cotton, is treated with a cold concentrated solution of caustic soda while under tension to prevent any shrinkage, and washed in this condition, a change takes place in the appearance and chemical structure of the fiber and it is said to be mercerized. The yarn or fabric has acquired a silk-like luster which is permanent, its affinity for dyestuffs has increased and an increase in strength is noted.

If the fiber is now viewed under a microscope it will be seen that its appearance has changed. It has become more transparent, the twist has almost entirely disappeared, the surface and diameter of the fiber has become more uniform, and consequently the reflection of light is more complete. It is this uniformity of surface and diameter which causes the luster, and the same determines the luster of any fiber. It is in all cases the geometrical properties of a fiber which determines its luster.

The idea of producing artificial silk is by no means a modern one. According to Foltzer (Artificial Silk and its Manufacture) in 1754 Reaumur, a French naturalist indicated its possibilities in a memoir on insects when he stated, "silk is only a liquid gum which has been dried; could we not make silk ourselves from gums and resins?" However, it remained for Count Hilaire de Chardonnet, the pioneer of artificial silk making, to make the product an article of commerce.

The different varieties of artificial silk now made on a commercial basis, with one exception, are simply pure cellulose (as is bleached cotton) composed of carbon, hydrogen and oxygen, which has acquired the luster of natural silk. They are therefore distinguished from real silk by not containing nitrogen. All artificial silks have some form of vegetable fiber for their origin, and as cotton when properly scoured is almost pure cellulose, it, with wood pulp, which is another form of cellulose, are the most important sources of artificial silk. In each method employed for its manufacture a solution of wood pulp, or cotton treated in such a way that it will dissolve in some solvent, is used.

There are four methods employed, classified by the solutions of cellulose used. They are:

1st. The Chardonnet or Collodion.
2nd. The Cuprammonium or Cuprate.
3rd. The Viscose.
4th. The Cellulose Acetate.

Chardonnet or Collodion Silk.

Chardonnet silk is made from nitro-cellulose or gun cotton. Tubize, made in this country by the Tubize Company, is a silk of this type. The raw materials may be cotton linters or wood pulp, but usually cotton is employed. Folzter describes the process somewhat as follows:

The cotton is transformed into nitro-cellulose or gun cotton by immersing it in a mixture of 15 per cent fuming nitric acid and 85 per cent of concentrated sulphuric acid. The cotton remains in the mixture four to six hours, and the degree of nitration depends upon the time of immersion. The acid is pressed out and the material washed until no trace of acid is present. Then the water is removed until no more than 36 per cent remains. In this state the nitro-cellulose is only slightly inflammable. It is then dissolved in a mixture of equal parts of alcohol and ether, the solution filtered, and stored in reservoirs for several days. An old solution will produce a better quality of silk than a fresh one. From this solution or pulp, as it is called, the silk is spun. This is accomplished by forcing the dissolved nitro-cellulose through fine capillary tubes or spinnerets under a pressure of 850 pounds per square inch. When the fine threads encounter the air, the alcohol and ether used as a solvent evaporates, leaving the fine threads of nitro-cellulose, several of which are grouped together as they pass through a guide to be wound untwisted on a glass bobbin.

The group corresponds to a count of one thread of natural silk. The threads are dried at 110 degrees F. to further remove the solvent. This lowers the inflammability of the thread but not sufficiently so as to make it safe to use. It is denitrated in a bath of alkaline sulphide usually ammonium, after which it is absolutely non-inflammable. When dried it is ready to be twisted and made into yarns of different counts. There are a number of variations in this process as carried on by the different makers but the principles of all remain the same.

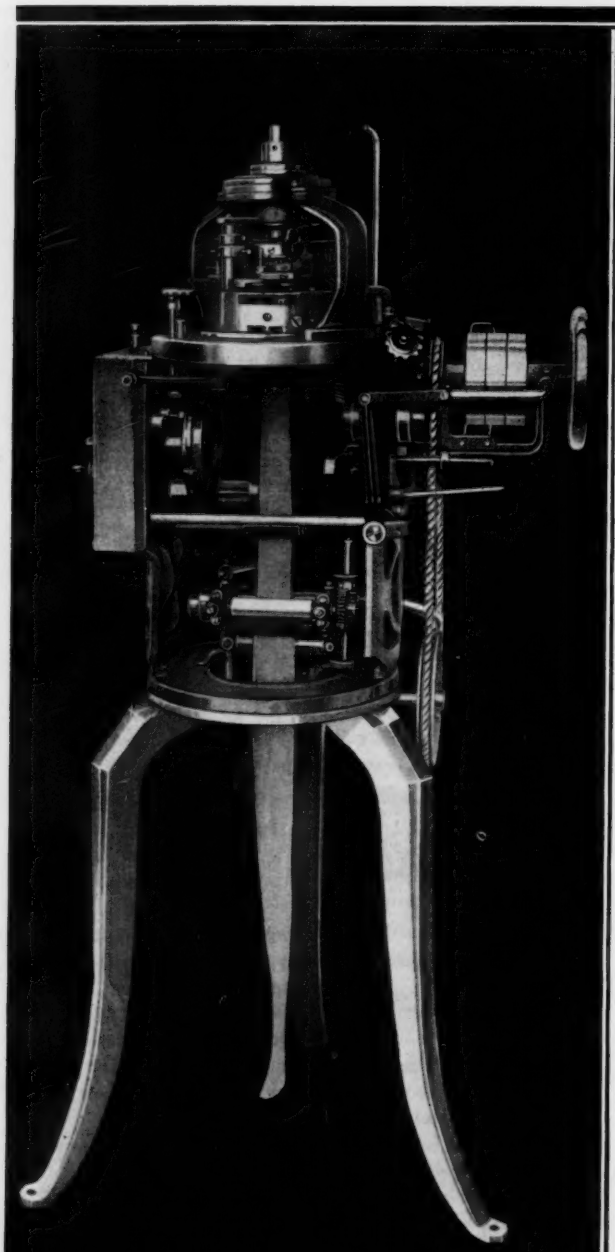
Cuprammonium or Cuprate Silk.

This type is sometimes referred to as Glanzstoff. Bemberg silk, used to some extent in this country by hosiery manufacturers, is a cuprate silk, made in Germany.

The manufacture of cuprammonium artificial silk depends upon the solubility of cellulose in an ammoniacal copper oxide solution. Wood pulp may be used for this method but the most advantageous material from an industrial standpoint is cotton. It is boiled out with soda ash and caustic soda and then bleached. The copper solution is prepared by filling a cylinder with small bits of copper and ammonia, and then agitating with compressed air. The bleached cotton is dissolved in this solution forming a blue viscuous liquid which decomposes quite readily unless kept cold. The mechanical operations are the same as for Chardonnet silk. As the thread emerges from the spinnerets they enter a dilute acid solution which removes the copper. After thoroughly washing, drying and twisting the thread is ready to use.

Viscose Silk.

This is perhaps the principle form of artificial silk at the present time and is prepared from cellulose thio-carbonate. According to Matthews, sheets of pure bleached wood pulp are ground with solid caustic soda until a fine crumb-like mass is obtained. The excess moisture is pressed out and the alkali cellulose thus formed is treated with carbon di-sulphide. This produces viscose which is gelatinous in appearance and of a clear brown or orange color. After its formation, it is dissolved in water, filtered



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and allowed to ripen for some time when it becomes more fluid. Then it is spun as the other silks, the jet as it comes from the spinneret passing into a coagulating bath of ammonium sulphate or dilute sulphuric acid. A number of the filaments are united to form the thread and after passing through the coagulating bath, it passes through a solution of copperas (iron sulphate) in order to remove all residual matter left on the fiber from the first bath. The threads are twisted and made into skeins after which they are steeped in acid to neutralize any remaining alkali. The acid is removed by washing, and any sulphur compounds are removed in a sodium sulphide bath. As in the other processes, there are many variations, both chemical and mechanical in the making of viscose silks.

Cellulose Acetate Silk.

The two silks belonging to this class are Lustron, made by the Lustron Company, and Celanese, made by the British Cellulose Products Company of England. The latter company is now erecting a plant in this country to take care of the American demand for its products.

Cellulose acetate, made by the action of acetic anhydride upon cotton in the presence of a catalytic agent, first came into prominence during the World War, when the so-called "dope" for airplane wings was prepared by dissolving cellulose acetate in a solvent. This solution was applied to the stretched mercerized cotton wings and when a shell passed through the fabric so treated, the fabric would not split as would be the case ordinarily.

The cellulose acetate silks are the most recent of the artificial silks, and are increasing in importance daily. The advantages claimed for them are that—

1st, they more nearly approximate natural silk in their specific weight.

2nd, they have a greater resistance to water than other types.

3rd, there is an increase in weight of silk produced above the raw material, whereas in other forms there is a decrease, and

4th, the threads may be spun at a much greater speed than other types.

In its manufacture, the cellulose acetate is dissolved in a suitable solvent (chloroform, ethyl acetate) and spun into water, much the same apparatus being used as for Chardonnet or Collodion silk.

The four principal classes of artificial silk have been briefly described. There are a few other types of minor importance, such as gelatine silk manufactured from ordinary gelatine made insoluble by a treatment with formaldehyde, zinc chloride silk made from cellulose dissolved in zinc chloride and formerly used for making electric lamp filaments, and silk made from milk, not interesting from a commercial standpoint.

Following are some of the properties of artificial silk:

The tensile strength and elasticity is from one-third to one-half of that of natural silk. The luster is much greater, the acetate silks more nearly resembling real silk than the other types. The hygroscopic moisture of artificial silk averages around 11 per cent, exceeding that of cotton and equaling that of natural silk. Art silk does not have as great a "covering power" as natural silk, that is to say, a fabric woven from art silk would not have the same solidity of appearance as a corresponding fabric woven from the same size and weight of real silk. All except the acetate silks become considerably weaker when wet and for this reason great care must be taken in laundering and dyeing of materials composed of artificial silk. It may usually be distinguished from natural silk by its excessive luster, but in case any doubt exists a simple test may be made by burning a thread of the material. Natural silk when burned, emits a characteristic odor resembling burning hair or feathers and a round globule forms on the end of the fiber, while artificial silk flashes leaving no residue and emits an odor like burning cotton. Another test not so reliable is to break a thread. Artificial silk breaks abruptly and cleanly while real silk frays at the broken ends.

Dyeing Artificial Silk.

The dyeing of artificial silks, excepting the acetate types is not a difficult matter, the greatest difficulty encountered being the prevention of injury to the wet fiber in its weakened condition.

The nitro-cellulose or collodion silks (tubize) have an affinity for the basic colors, probably due to the fact that oxycellulose is present. With cuprammonium and viscose silks the affinity for basics is slight and for medium or heavy shades it is necessary to employ a mordant as for cotton. The basics may be used on the acetate silks without a mordant as these silks contain acetyl groups which are probably displaced by the basic coloring matter. The direct cotton colors are applicable to viscose, cupra and collodion silks in a neutral salt bath just as for cotton, except that a temperature of 160 degrees F. is more desirable than a boil, although in many instances, hosiery for example, it is customary to boil the material. Sulphur and vat colors may be and are used on these types when greater fastness is desired than is possible to get with the direct or basic colors.

It may be well to mention that the affinity of the art silks for dyes is much greater than that of plain or mercerized cotton. This greater affinity is sometimes a decided disadvantage when the two fibers are mixed, as in the case of hosiery with cotton heels, toes and tops and an art silk body. When such hosiery is dyed in medium or heavy shades there is always a distinct contrast between the cotton and silk parts, the cotton being much lighter. There are a few of the direct cotton colors which do not exhibit this difference in affinity to such a marked degree, and by using such colors, together with some soluble oil in the bath, the best unions are obtained. In light shades and tints, it is possible to obtain perfect unions. Artificial silk is also used in combination with real silk to make a class of hosiery which resembles closely an all silk stocking but which is of course cheaper to make.

Three fibers, cotton, silk and art silk are present and the dyeing of such material requires the utmost skill and a thorough knowledge of dyestuffs to obtain a perfect union on all three fibers.

Celanese, one of the more recent of the cellulose acetates, has little affinity for any of the ordinary coloring matters, excepting the basic and a few of the acid and alizarine colors. The affinity for these few colors is so little, however, that in many instances the fiber is only slightly stained, using high percentages. Much research work has been done by the makers of Celanese, with the result that a new class of dyes, called the ionamines, has been developed, and also a new dyeing method, viz: the

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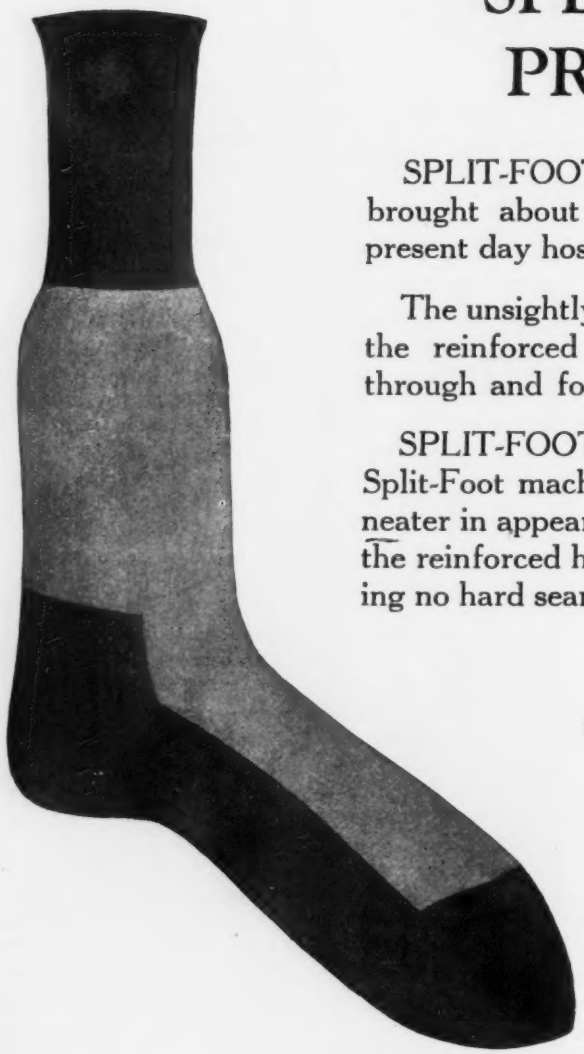

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dispersion method. In dyeing by the dispersion method, which seems to be the most satisfactory way of coloring Celanese, suitable dyes, ordinarily insoluble in water, are mixed into a paste (10 per cent) with a sulphonated castor oil and then added to the warm dyebath containing soap. The insoluble coloring matter is held in solution colloidally, or may be said to be held in suspension in such a highly divided form that it does not settle out, and the particles of color will pass through a filter paper.

The sulphonated oil is responsible for this phenomena and the explanation involves physical and colloidal chemistry. The Celanese is dyed in this bath at 165 to 170 degrees F. for one hour, and exhausts the bath of color quite well. Colors may be obtained from the makers of this silk all prepared for use and in the form of a 10 per cent paste. They are called the Celanese S.R.A. colors.

Oil yellow, oil red and Sudan B, particularly the first named color, give good results by this method if they are pasted with a high grade 75 per cent Turkey red oil in a proportion of one part of color to nine parts of oil and then the paste added to the soapy dyebath. Azo yellow A5W, an acid color made by the National Aniline Company, produces a medium shade of yellow with 5 per cent of dye. It is simply dissolved in hot water and added to the bath. There is perhaps much investigating that may be done on the dyeing of the acetate silks.

Many beautiful effects may be obtained in a fabric by combining acetate silk with the other art silks and cotton. When such fabrics are dyed the colors which will dye the cotton and ordinary art silk leave the acetate silk white, and if desired the latter may subsequently be dyed a different color in another bath by using the correct dyes which will not stain the other fibers. Two color effects may also be obtained in one bath by selecting the proper combination of dyestuffs.

In spite of the fact that the textile industry has been dull during 1924 it is estimated that the production of artificial silk for this year will be 40,000,000 pounds, an increase of 567 per cent since 1918. These figures show the increasing importance of artificial silk in the textile industry.

Bibliography—Artificial Silk and its Manufacture, Foltzer; Textile Fibers, Matthews; American Dyestuff Reporter.

Knitted Fabric Contraction

BY WILLIAM DAVIS, M. A.

To follow the contraction undergone by knitted fabrics on leaving the machine and also in scouring and finishing, let an example be given of a plain fabric worked on the well known French or German circular frame. The pattern given herewith in Fig. 1 is a finished cloth made from wool and the texture has been produced on the 24-gauge fein which has 16 needles per inch in the cylinder, measured where the stitches are formed on the needles. The pattern in Fig. 1 shows 20 stitches per inch and 21 courses per inch in the fabric and taking the width on the needles as 40 inches, this gives $40 \times 16 =$ needles in the machine.

FIG. 1.

Now the finished fabric shows that there are 20 stitches per inch so that the width in the finished fabric is given by $\frac{40 \times 16}{20} = 32$ inches wide. On a width of 40 inches there is a contraction of eight inches and this expressed as a percentage will give $\frac{8 \times 100}{40} = 20$ per cent contraction. This is the smallest contraction shown so far and is very much less than that given in a former article for latch needle circular frames. In those latch needle machines it would appear that the yarn is heavily pulled out of its natural position during the knitting action, the hook strains at the thread and each hook in turn repeats this in the spring needle circular machine, and also in the spring needle flat frames, the needles receive their share of yarn apportioned out and the thread is given time during loop formation to lie naturally in its curved position. The figure of 20 per cent combined contraction from machine to grey width and further from grey to finished width is very small. In the finished fabric here the needles to courses ratio is $20 / 21 = .95$.

It may be of interest to give another example from a different type of bearded needle circular frame, that of the loop wheel, where the fabric proceeds upwards and the needles are arranged shoulder to shoulder round the circle. Fig. 2 shows a fabric from this machine in the scoured condition where the stitches number 16 per inch. This has

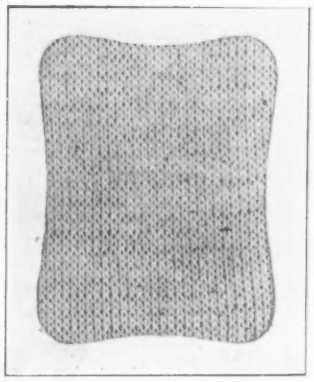

FIG. 2.

Approximately ninety per cent of all American Manufacturers of full-fashioned hosiery—leading the world in the production of finest, ladies' silk hosiery—are using "Reading" Full-Fashioned Hosiery Machines.

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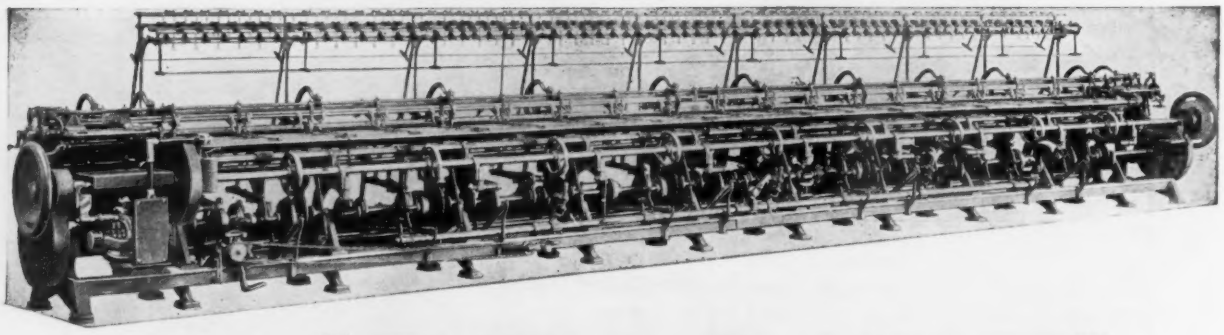

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been worked on a machine having 12 needles per inch so that taking a machine width or circumference of 40 inches, the finished width calculated from these data will be $\frac{12 \times 40}{16} = 30$ inches wide. A loss of 10 inches on a grey width of 40 inches gives $\frac{10 \times 100}{40} = 25$ per cent combined contraction. The needles — courses ratio is 16 / 18 = .9 practically. In this case, also, a combined contraction of 25 per cent is very much less than was the case with the latch needle fabrics examined.

Figure 3 gives an example of a fabric taken from the circular scarf machine, having a diameter of about 8 inches. The machine is set with its needles 5½ to the inch

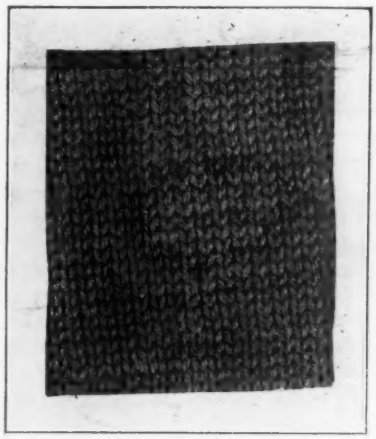

FIG. 3.

or 11 needles on two inches. In the fabric the stitches per inch measured are eight, so that taking a hypothetical width of 40 inches again for convenience, the ratio can be used thus: $\frac{5\frac{1}{2} \times 40}{8} = 27\frac{1}{2}$ inches finished. This worked out as a contraction percentage shows 31¼ per cent contraction for this type of fabric.

When one takes these measurements on the rib body machines and other varieties of rib knitting mechanism one experiences another series of differences mostly in greatly increased contraction, particularly in the width. Fig. 4 shows a finished fabric obtained from the "Swiss" vest circular rib machine which is largely used for this particular branch of the cut-up fabric trade. In this machine there were 10 cylinder needles per inch. and for each cylinder needle there is a ribber needle. Taking only the cylinder or face fabric stitches for the present, we can arrive at the contraction percentage by measuring the number of stitches per inch in the finished pattern shown in the figure. This fabric shows 19 stitches per inch, counting the face or cylinder stitches only, so that taking the convenient width of 40 once more, the new width will be $\frac{10 \times 40}{19} =$ 21 1/19 inches finished. $\frac{21 \times 40}{100} = 52\frac{1}{2}$ per cent shrinkage for this ribbed fabric. In this case the stitches — courses ratio is obtained thus: there are 19 face stitches per inch which gives 38 stitches actually counting face and back, there are 26 courses per inch finished so that the ratio is given by 38/26 = 1.46. This is the highest ratio encountered so far and the contraction also is very much in excess of what is found in usual fabrics plain in stitch. In considering this fabric, however, one has to remember that the effective width as far as wear is concerned is much greater than that shown when the fabric is at rest on the warehouse table. When such garments are being worn, they stretch enormously as showing that the latent elasticity is considerably taken up in wear.

These examples give some guidance as to how the important point of gauge can be determined when nothing but the finished particulars are available, and these only by measurement. If the garments are recognized as being full-fashioned on frames of the Cotton's patent class, the combined contraction for cotton goods will be in the region of 15 to 20 per cent, while for similar goods in cotton and wool, the combined contraction from the needles will be rather more, say 22 per cent, while pure wool goods will show a still higher figure of combined contraction up to 30 per cent or 40 per cent in some cases, this depending on the quality of the wool and the degree to which the unshrinkable process is effected in the garment. In circular fabrics, particularly those made on small widths of frame, the contraction is excessive if left to itself, but a normal width has to be restored by stretching over forms and boards in pressing or calendering. It will be clear from those examples that the items referred to can be calculated

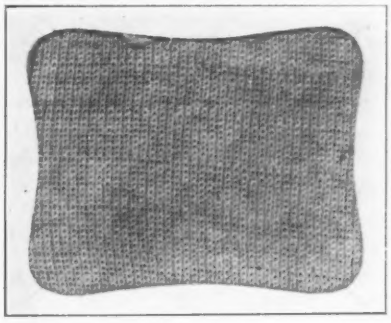

FIG. 4.

from the grey or finished particulars, and it can be stated what the sett in the finished fabric will be, allowing for a certain contraction. Also the number of stitches per inch finished can afford valuable data as to the shrinkage percentages which the garment or fabric has been subject to.

If the finished pattern be cut out to a size and weighed the valuable item of ounces per yard can be obtained, but in other cases the weight per yard can be obtained by making a measurement of the degree of curving in the thread when it is taken from the pattern. If, for example, you have a width of say 40 inches for convenience as has been used throughout, then the degree of curving in any thread unroved from the fabric can be at once secured by measurement. As a rule a much smaller width of fabric only will be available but it is a matter of proportion. Suppose the fabric is six inches in width and after a number of courses have been unroved, stretched straight and then measured, it is found that the average length of

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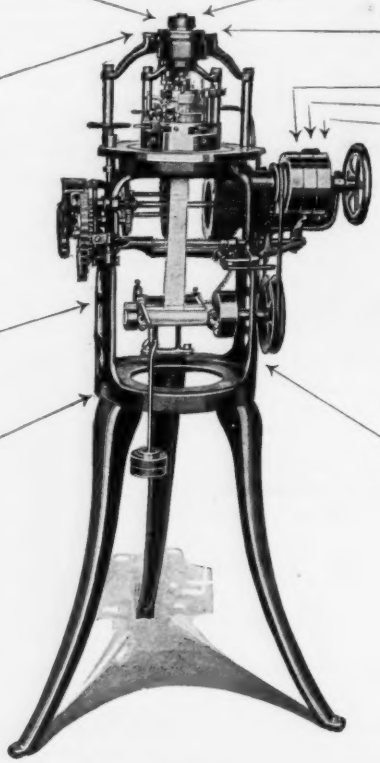

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thread required to produce this fabric is 15 inches, then 15 ÷ 6 = 2½ is regarded as the take-up.

Having obtained this factor, it is easy to calculate the weight per yard in ounces given the counts of the yarn in the fabric. This, of course, can be obtained by weighing the lengths of thread available and finding out, in the case of cotton the number of hanks or cuts of 840 yards each which will weigh one pound; for worsted the number is 560. Let a case be taken where the yarn is 16 cotton counts with 20 courses per inch in the fabric and where the measured take-up finished is 2½. The ounces per yard can be derived in the following manner:

$40 \times 2\frac{1}{2}$ = inches of yarn for one course.

$40 \times 2\frac{1}{2} \times 20$ = inches of yarn per inch of fabric.

$40 \times 2\frac{1}{2} \times 20 \times 36$ = inches of yarn per yard of fabric.

Dividing this by 36 will give the yards of yarn per yard of fabric, and taking the counts as 16s cotton, 16×840 = yards in one pound. In this way the pounds weight of the fabric per yard can be obtained:

$$\frac{40 \times 2\frac{1}{2} \times 20 \times 36}{36 \times 16 \times 840} = \frac{25}{168 \text{ lb.}} = \frac{25 \times 16}{168} = 2.4$$

ounces per yard.

It will be noted that in this case the 36 on the top of the line cancels the same number on the bottom so that other examples may be worked by omitting this figure from both top and bottom of the expression.

Let another example be taken of a fabric having 16 courses per inch of 10s worsted counts and let the take-up be measured as 2¼, then the weight per yard will be obtained as in above formula, omitting the 36 above and below the line:

$$\frac{40 \times 2\frac{1}{4} \times 16}{10 \times 560} = \frac{9}{35} = \frac{9 \times 16}{35} = 4.1 \text{ ozs. per yard.}$$

If the fabric is cut out by a template the particulars can be obtained by weighing, the unit employed being generally the grain; this gives 7,000 grains in one pound, but a more convenient figure is to work out the number of grains per ounce thus: 7,000 ÷ 16 = 437½ grains per ounce. Let an example be taken where a piece of knitted fabric is cut out to a width of two inches and a length of three inches which is a very usual dimension for these dies to be made. If the piece weighs 15 grains, the next step will be to find out by proportion the grains' weight in an area of fabric 40 inches wide and 36 inches long, because the weight of fabric varies directly with the area. $2 \times 3 : 40 \times 36 :: 15 :$ This will give the answer in grains and to obtain ounces divide by 437½ as shown below:

$$\frac{40 \times 36 \times 15}{2 \times 3 \times 437\frac{1}{2}} = 8 \text{ ounces per yard.}$$

Let another example be taken where the fabric is a striped one composed of a silk thread equivalent to 20s cotton counts, 4 courses, alternating with 6 courses of a cotton yarn of 12s counts, these two materials forming a horizontal stripe with an average of 30 courses per inch; the silk threads have a take-up of 2½ and the cotton courses a take-up of 2¼. The combined weight per yard of these two materials can be calculated in two ways:

(*A*) The average counts of the material can be found and the whole calculation made on the basis of the average counts. Now the average counts must not be confused with the resultant counts as is very frequently done in practice. The resultant counts are secured in the ordinary way and represent the counts of these threads when twisted together, but for the average counts, the resultant figure has to be multiplied by the number of threads in the pattern.

(*B*) A more direct and convenient way is to calculate the two elements separately as two different fabrics and add the two weights together to obtain the ounces per yard. As the two materials are worked 6 and 4, and as there are 30 courses per inch, this will give by proportion 12 courses per inch of the silk and 18 courses per inch of the cotton.

Take the silk element first:

$$\frac{40 \times 2\frac{1}{2} \times 12}{20 \times 840} = \frac{1}{14} \times 16 = 1.1 \text{ ounces per yard due}$$

to silk.

$$\frac{40 \times 2\frac{1}{2} \times 18}{12 \times 840} = \frac{9 \times 16}{56} = 2.57 \text{ ounces per yard due}$$

to cotton.

These two factors added together give a total of 3.67 ounces per yard.

Among the Knitting Mills.

The Pannill Knitting Co., Martinsville, Va., has applied for charter, with capital stock of $100,000. It is understood that underwear machines now are being installed. W. L. Pannill is general manager.

Recommendation for the establishment of a knitting mill, to be operated by convict labor, in the North Carolina State Penitentiary, has been made by George Ross Pou, superintendent of prisons, Greensboro, N. C.

It is reported that an addition will be made to the plant of the Ashe Hosiery Mills, at Knoxville, Tennessee.

Eclipse Knitting Mills, Newark, N. J., will erect a three-story mill, 80x91 feet, to cost about $75,000, it is reported.

J. W. Boland, R. A. Dobson and others have made application for a charter for the Sultrene Mills, at Gaffney, S. C., for the manufacture of hosiery. Mr. Boland was superintendent of the plant of the Gaffney Knitting Mills, which was destroyed by fire some time ago.

Wearproof Hosiery Company, Burlington, N. C., has been organized by David D. DeMoss and others. It is understood that 100 Scott & Williams Model RI machines now are being installed.

The Scottsboro Hosiery Mill, at Scottsboro, Ala., has canceled its charter and now is being operated as a partnership. J. C. Jacobs is president and C. E. Spivey is secretary and manager. The new organization has purchased two buildings from the Scottsboro Wholesale Company and expects to double the output of the mill by early spring. They manufacture only pure and artificial silk half-hose, and their present capacity is about 700 dozen per day. As stated, this will be increased to approximtaely twice that amount when the new additions are completely equipped.

The Creighton Knitting Mills, Inc., Waltham, Mass., has completed plans and will soon break ground for the erection of a new three-story addition, estimated to cost

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As you can see from the details listed at left, this method is highly efficient. The work is done on power or hand flat knitting machines of *any kind*. As long as it is a flat knitter, it can be changed. The change does not affect the ordinary operating capacity. Production remains practically the same. Any stitch you have ever made—you can still obtain it after a machine has been transferred.

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Any flat machines now on hand adapted.

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Patterns quickly purchased at small cost by us.

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close to $50,000. W. M. Haines, 32 Riverview Avenue, Waltham, is architect.

The Progressive Knitting Works, Inc., 334 Fifth Avenue, New York, has arranged for an increase in capital from $200,000 to $500,000, for general expansion.

The Warren Knitting Co., Wright Street, Milwaukee, Wis., has awarded a general contract to the Wisconsin Bridge & Iron Co., North Milwaukee, for the construction of a one-story addition to its mill, to be 47 x 150 feet, estimated to cost close to $50,000. Work will be placed in progress at once.

The Israel Brothers Co., 224 South Market Street, Chicago, Ill., has been formed under state laws with a capital of $150,000, to operate a local knitting mill, for which arrangements will soon be perfected. The incorporators are Henry B. Floyd, Louis Grollman and T. W. Bramhall.

The Reliance Hosiery Mills, Inc., Shamokin, Pa., recently organized, will operate a local knitting mill. The company will commence business with a nominal capital of $10,000. Joseph W. Maus, Shamokin, has been elected treasurer and will represent the company.

The Unrivaled Hosiery Mill, Williamstown, Pa., has taken over a building at Frackville, Pa., and will install machinery at an early date for a new branch plant.

Foumberg Brothers, Inc., Brooklyn, N. Y., recently organized, will operate a local knitting mill. The company is capitalized at $15,000, and is headed by W. and L. Foumberg, and M. Rich. It is represented by M. Wolfman, 60 Graham Avenue, Brooklyn.

The Metric Knitwear Co., 28 West Twenty-second Street, New York, has arranged for an increase in capital from $25,000 to $50,000, for general expansion.

The Victor Garment Co., Muncie, Ind., manufacturer of knitwear, has acquired the former local factory buildings of the Pioneer Pole & Shaft Co., and will remodel and improve for a new mill. The present plant will be removed to the new location. It is purposed to install about 250 knitting machines and auxiliary equipment, or approximately 150 more machines than heretofore operated.

The Winchester Knitting Co., Adelaide Street, Winnipeg, Man., is planning for the rebuilding of the portion of its plant recently destroyed by fire with loss estimated at close to $35,000, including equipment.

The Dutchess Knitting Mills, Inc., New York, recently formed with a capital of $100,000, will operate a local knitting mill, for which arrangements will be consummated at an early date. The company is headed by S. Slote and D. T. Eisner, 231 West 107th Street, New York. The last noted is representative.

The Gopher Knitting Works, 521-25 West Broadway, Minneapolis, Minn., are considering preliminary plans for the early rebuilding of the portion of their plant recently destroyed by fire with loss estimated at approximately $50,000, including machinery. The re-construction will cost close to a like amount.

The Brown Hosiery Mills, Brooklyn, N. Y., recently chartered under state laws, will operate a local knitting mill. The company is headed by M. A. Brown and A. Kramer, and is represented by A. A. Beaudry, 256 Broadway, New York.

The Acme Knit Goods Co., St. Louis, Mo., lately organized, is said to be perfecting plans for the establishment and operation of a local knitting mill. The company is headed by Lawrence New and Rudolph E. Dralle, 5967 Plymouth Street, St. Louis.

Abraham Letterman, New Yirk, has leased a floor in the building at 130-34 West Seventeenth Street, for the establishment of a new local plant for the manufacture of knit goods. Equipment will be installed at an early date.

The Babewear Knitting Co., New York, has been formed under state laws to operate a local knitting mill. The company is capitalized at $10,000, and is headed by E. A. Duffey, G. J. Brownstein and J. W. Schwartz, 291 Broadway, New York. The last noted is representative.

The Scotch-English Knitting Mills, Inc., 124 South Wells Street, Chicago, recently formed under Illinois laws, will operate a local plant for the manufacture of knit goods. The company is capitalized at $20,000. It is headed by A. C. and K. F. Thompson, and Monroe H. McKillip.

The West Branch Knitting Co., Shamokin, Pa., has leased for a long term the building now occupied by its local mill, and is said to be arranging for extensions and betterments. The main mill of the company is at Milton, Pa., and will be continued in operation as heretofore.

The Unique Knitting Mills, 824 Kalb Avenue. Brooklyn, N. Y., have filed notice of change of name to the Unico Knitting Mills, Inc.

The Pan-American Knitting Mills, Inc., 1679 Union Port Road, New York, is said to be perfecting plans for the rebuilding of the portion of its plant recently destroyed by fire with loss reported in excess of $42,000, including equipment.

The Norristown Hosiery Co., Lansdale, Pa., has arranged for a change of company name to the Dexdale Hosiery Mills, Inc. Plans are under way for extensive additions in the local plant to more than double the present output, and it is purposed to begin work at an early date. The company will discontinue production at its Norristown, Pa., mill, and will remove the equipment to the Lansdale plant, where the working force will be considerably increased.

The factory building of the Brown-Phelps Hosiery Co., Philadelphia, is in the hands of W. Bruce Barrow, a real estate operator, for sale. The owners decline to state their intentions in the event of the property being sold. The company has been making seamless hosiery and selling to retailers.

The greater part of the machinery of the Allen Hosiery Co., Inc., Philadelphia, has been sold at private sale, the remainder being still in operation. While the future plans of the company have not been disclosed, it is intimated in the trade that it has been offered opportunity to supply an establishment selling direct to consumers through canvassers. It sold to retailers and employed the trademark "Welldrest."

Practically all of the machinery of the Royal Ascot Knitting Mills Co., Philadelphia, has been put on the market, the company announcing it has discontinued the manufacture of sweaters and other outerwear lines, operating 300 knitting machines and 250 sewing machines. No explanation for the sale of the plant is given. It is understood the company probably will, for a time, continue making a restricted line of neckwear.

J. K. MILLIKAN is superintendent of the Love Knitting Mills, at Burlington, N. C.

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Streaks in Hosiery Dyeing.

EDITOR COTTON:

I am going to be interested in reading answers in "Knitting Kinks" to the problem of "M. H. (Tenn.)," as stated in the January issue, with reference to dark streaks in the mercerized heel, toe and top of an artificial silk plaited stocking. We had this same trouble and we found that the dyer had the dyebath too warm when he entered the goods. The bath should be barely warm and must not be heated too quickly after the goods are placed therein. A good grade of soluble oil should be used in the bath, and if dyed in a vat without paddle wheel, constant poling is necessary until the goods have taken up the dye, then thereafter about every fifteen minutes. To us the main trouble in this case seems to be that the dyebath has been at too high a temperature at the start, which caused the dye to go onto the artificial silk too quickly, or in other words, the artificial silk took the dye before the mercerized top, etc., had a chance, and therefore the dark streaks resulted.

N. (GA.)

Random Dyeing Underwear Yarn.

EDITOR COTTON:

We are interested in random dyeing for men's underwear, and I should like to ask some questions of any of your readers who have experience with this work.

As I understand it, there are three types of machines for doing this. One applies the dye by means of a needle forced in from the outside of the cone. The second punctures the cone on which the yarn is wound and draws the dye into it. The third is an attachment to be put on the winder with a device for placing the yarn while being wound in contact with felt rollers at intervals, the lower part of the rollers passing through the dye solution.

Our experience has been that the application of the dye sort of mats the yarn together on the cone, making it necessary to back-wind it before it is put on the knitting machine. I should like to know if anyone has found any method of treating the yarn, etc., to eliminate the necessity for back-winding, thereby taking the cones directly to the knitting machine. Personally, I cannot see how the back-winding can be eliminated with the two first-named methods of random dyeing, because the manner in which the dye is applied causes the outer layers to take on more dye than the inside layers and we have to back wind in order to get the dye evenly distributed throughout the cone on the knitting machine. The third method may admit of some plan to do away with the back-winding. If anyone has solved this problem with any of the systems, I should be pleased to have them tell of it through "Knitting Kinks," and in return we shall be pleased to advise of any findings we may make in our further experiments.

Also I should like to know how the defects resulting in making random-dyed garments compare with those in straight white work, from the standpoint of holes, etc.

Contributor No. 737.

We invite our readers to make use of this department for the discussion of any and all problems arising in connection with the knitting mill from the office to the packing and shipping departments. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. All questions will be answered as promptly as possible. The names and addresses of the contributors must be given, but will be held in confidence and a pen name substituted when printed. All accepted contributions other than questions will be paid for after publication. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

The Value of Overtime Operation.

EDITOR COTTON:

"Is it profitable to operate a knitting mill overtime, if two shifts of operatives must be employed, for meeting a probably short-lived demand for goods?" was a subject discussed at an informal conference of a group of hosiery manufacturers. The consensus was that, in the long run, unless there be practical assurance of long continued necessity for overtime operation, it is not profitable.

The discussion grew out of the boast of a manufacturer, who was having an unusual demand for a type of women's novelty hosiery, that he was operating the mill with a double shift of knitters, until 10 o'clock nights, the time limitation set on night work for women by a Pennsylvania statute. "We might run all night and sell our production, at the rate orders are coming in," he said. Four other manufacturers present said they were operating at 100 per cent capacity, never had run their plants nights and never will. "With demand sufficient to keep the machinery going nine hours a day," they agreed, "prices and profits might be expected to be all that any manufacturer ought to look for."

Overtime operation, it was contended by this quartette, usually leads to an oversupplied market, when losses that often must be suffered offset much of the previous profits, leaving a situation from which recovery usually is slow. Furthermore, it was contended, a knitting machine, like a human being, requires rest, if all that is in it is to be gotten

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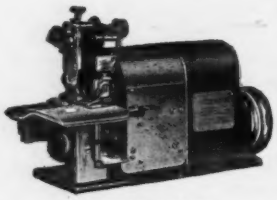

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out of it. One point emphasized by the opponents of overtime work with double shift was the danger of splitting up the care of knitting machines between two crews of fixers. A fixer employed on one shift, it was contended, may undo what was done by one on the other shift.

The manufacturer running his mill with two shifts of operatives admitted the validity of the argument of the four others, but felt his course was justified by the fact his profits for the time were more than taking care of certain losses last year. "In a few months, perhaps," he said, "the novelty number I am making may come into sharp competition with others yet to come out and not have so profitable a standing in the market. What you say about the fixers, and danger of crowding the market with goods, is true," he admitted, "but I believe in running while the running is good, and just now it is better than I have known it to be in five years. If my line runs into a glutted market, I probably will be able to put a new one on sale, and perhaps keep on doing what I am doing now—running two shifts."

"But suppose novelties drop out and staples return to favor?" suggested a disputant. "You will have a stock of freak stuff, worth, maybe, about half the cost."

"As to a general proposition, you are right," the overtime advocate agreed, "all the argument is on your side, and I would follow your suggestions if I did not believe that my line is better than any other mill's. I know I am taking a long chance, even at that, but my overtime work is compensating me for the part time work I had a few months ago, and the merchants are paying the bill."

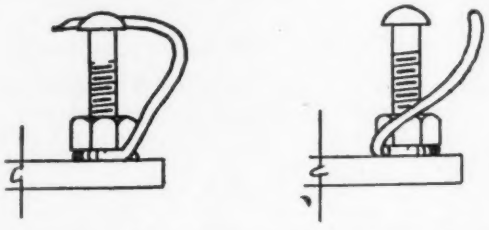
The five hosiers concurred in the view that jerky mill operation—part time for a period and then overtime—makes for higher cost and, obviously, higher prices—but that it is forced on them by the jerky manner in which merchants do their buying. R. L. P. (PA.)

To Prevent "Puckering" in Transferring.

EDITOR COTTON:

Having noticed in "Knitting Kinks" a question about getting the loose course to come together on a ribber to eliminate "puckering" in transferring, I will tell you what we do in this connection.

When the ribbers come from the factory, they are equipped with a cam for raising the dial needles in making the



loose course. What we do is to take these cams off, and substitute a piece of steel wire to perform this function. It is rather hard to explain on paper just how this is done, but with the accompanying sketch I will try to describe it.

Only the cam itself is removed, and one end of this wire substitute is fastended to the threaded bolt and held down by the nut. The wire is bent around in about the manner shown, so that the other end will come under the dial needles and hold them up. The end of the wire that goes under the needles is sloped off at the end as shown.

By doing this, we have only about two needles held up at a time, while the cam holds up eight or ten. The wire is so bent and shaped at the end so that after the course is made it leaves the needles gradually, and not suddenly, as with the cam, so the needles are not plowed into and smashed up.

As to making the French welt with the double feed, if your correspondent will use this wire in the place of the cam, and let it come in between the two feeds, I don't see why he would have more than one stitch in between the ends of his loose course, and thus bring them that much closer together. S. O. R. (TENN.)

Why the Large Loops in Mock Seaming?

EDITOR COTTON:

I have a problem that I believe is common to a number of mills. If anyone can suggest something to help it, we shall appreciate it.

What causes a machine to make unusually large loops on the mock seaming attachment? We have our Scott & Williams K machines on mercerized and cotton work equipped with this attachment, and every now and then the loops will be from an inch to two inches long on the inside of the stocking. Then we have to pull the mock seam out and take the stocking to the back seaming machines and seam them to save the goods from waste.

I understand other mills have this problem, and I know any suggestions would be read with interest.

Contributor No. 723.

What Makes the Holes?

EDITOR COTTON:

I should like to ask a question relative to the H-H machine. Occasionally we find one of our machines will make a hole in the top, that looks just as if a needle had punctured the fabric. This does not occur in any one place, but at different points throughout the top. We have secured the proper distance between the dial and the cylinder so that the lower bits on the dial do not press against the saw-tooth sinker, as one man suggested might be the trouble. I think it is the latch cutting the thread on the cylinder needle.

If any of your readers have come across this problem on this machine, I should be pleased to have them write "Knitting Kinks" and tell how they overcame it.

Contributor No. 726.

Needle Breakage and Production.

EDITOR COTTON:

Just as a matter of interest and for the sake of comparison, I should like to have some readers give answers to the following questions for "Knitting Kinks":

In making ladies' hosiery from artificial silk, on 240-needle, 3½-inch, Model K, Scott & Williams machines, what is your average needle breakage? In other words, how many dozen do you get to the needle? How many dozen do you get to the transfer jack? And how many to the sinker?

If your readers will tell us their experiences on these

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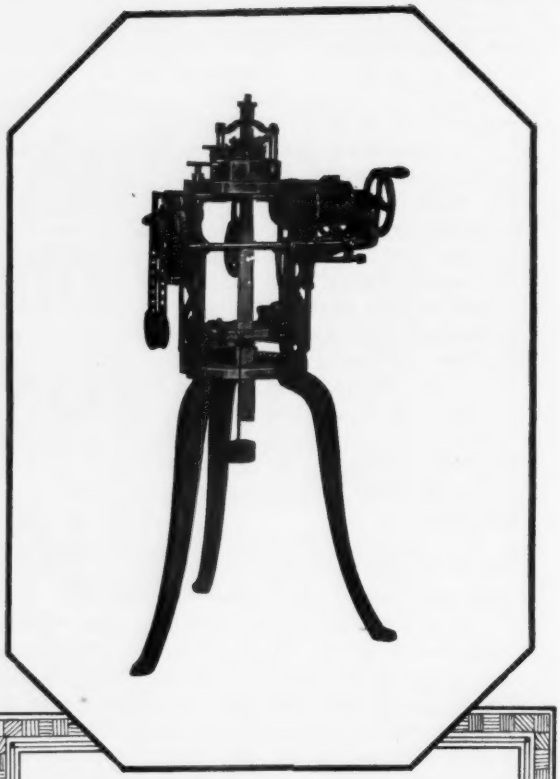

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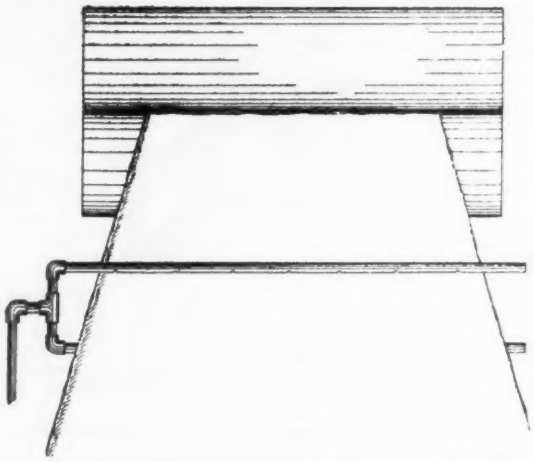
points, I think we will find it interesting to learn how we compare with the other fellow. B. S. C. (N. C.)

Removing Curl From Knitted Woolen Fabrics.

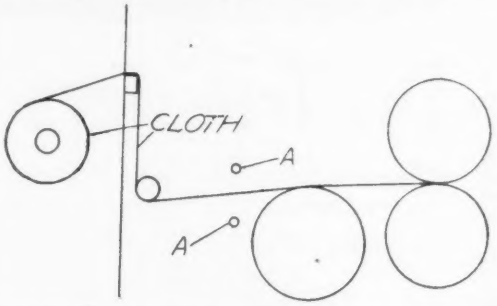
EDITOR COTTON:

In answering the inquiry of your correspondent "C. M." will say that to eliminate the curl in cloth made from wool yarns, the cloth should first be washed if possible, as there is no process known to me that is as effective as washing in eliminating the tendency to curl.

After washing and drying, as the cloth is fed to the rolls of the calendering machine it should pass between two



parallel steam pipes (size about ½ inch) pierced at intervals of about 2 or 2½ inches so that live steam is forced through the cloth from both the upper and under side before coming in contact with the heated rolls of the calen-



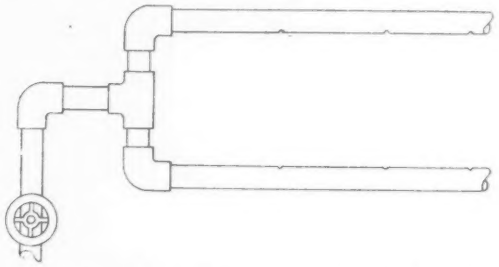
dering machines. If it is not practicable to wash the cloth this steaming process should be used by all means.

If "C. M." will follow this plan as closely as his conditions permit he will find a decided improvement in handling his cloth. A rough sketch of the idea is shown herewith. P. A. (N. Y.)

EDITOR COTTON:

Responding to the query of your correspondent who is having difficulty with worsted yarn knitted into circular fabrics curling when the fabric is cut, will say that the curling of this material is caused by the natural tendency of wool yarn to wrinkle and move. The party in question is following the proper method by calendering this material by the steam-heated rollers, but this process is not enough in itself to eliminate curling on the cutting table. If the cloth were steamed before being passed through the steam-heated rollers—by steaming I mean that a considerable quantity of live steam be injected through it—the curling tendency would be greatly reduced.

I understand there has been manufactured a calendering machine for circular knit goods, in front of which is placed a steaming box with four perforated pipes. Two of these pipes are on the bottom, and two are on the top. The cloth passes between the upper and lower pipes, is thoroughly dampened or moistened by the steam, and then



passes on to the hot rollers which again dry the cloth and at the same time impart a finish. It may be that your correspondent would have to run the calendering machine a great deal slower in order to evaporate and remove the moisture injected by the suggested steaming arrangement. This, however, is well worth while because the saving of cloth and the better finished product when cloth with the tendency to curl is handled will pay for the slight increase in finishing cost. W. A. G. (OHIO)

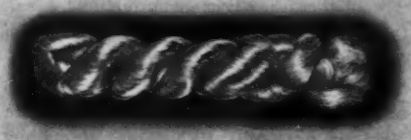
A Permanent Record of Goods in Process.

EDITOR COTTON:

If you will allow me space in "Knitting Kinks," I will endeavor to give the readers a little of my experience in keeping records of goods in process which I have found to be very helpful to myself and others who have used it.

When I was a boy in the mill, I was just like all other boys in many respects. When I found that the others took short cuts I also took short cuts; and I am sorry now that I must admit there were times when all of us boys were not as honest as we should have been. Oh, we were not guilty of stealing a cow or a horse or $10,000, but we were guilty sometimes of counting short in our dozens. That is, we would put in some dozens or bundles only 23 or 22 stockings, and if those who handled them after us did not count them, we received pay for the full count, and we did not stop to think a great deal about it. If we got caught we simply made up the shortage, and went on. We boys gave this very little thought, as I said before, and it seemed that so long as the management did not know we did it purposely, all was o.k., and they cared little, or at least said little. In later years I have learned that the reason they cared or said so little was that they did not know, and I have wondered how many mills are still doing the same way, losing each day in the year not only from the knitters, but all the way from the knitting to the case?

I had some years as overseer in one or two mills and paid little attention to checking up on my knitters. We used tags on our lots of goods as they went from one department to another, but nobody counted in particular or



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THE STANDARD IN QUALITY - THE FAIREST IN PRICE

cared whether the lot contained full count or not. We would take our file in the late afternoon and go to the knitters and ascertain from them the amount of work done during the day. Then on the following morning someone would take this work to the turners, and thus it would pass unconcernedly, and, so far as checking back was concerned, undisturbedly from operation to operation. I suppose that there are no mills today that are so asleep that they are using such careless methods, but I do know there are some supposedly good mills that are very careless and not aware of the fact that they are perhaps being robbed by their own most trusted employees.

It was not until I had contracted to run a mill on my own account that I discovered a few things. I was receiving so much for the finished product, the owner of the mill furnishing all raw material and power, I furnishing the

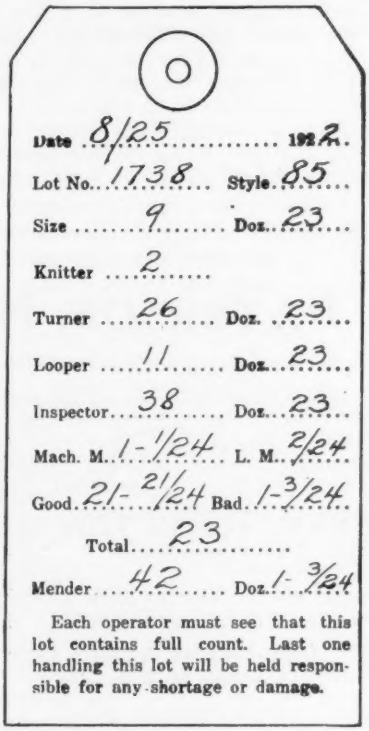
Date 8/25 192 2.
Lot No. 1738 Style 85
Size 9 Doz. 23
Knitter 2
Turner 26 Doz. 23
Looper 11 Doz. 23
Inspector 38 Doz. 23
Mach. M. 1-1/24 L. M. 2/24
Good 21-21/24 Bad 1-3/24
Total 23
Mender 42 Doz. 1-3/24
Each operator must see that this lot contains full count. Last one handling this lot will be held responsible for any shortage or damage.

FIG. 1

labor. Delighted in the new experience, I was getting production up to the highest notch, and things were moving on nicely and after a pay day or two I decided I would check up on myself a little and see how I stood with myself and the mill. Well, I found myself to be a little short somewhere, but as it did not amount to a great deal I did not take it seriously, and things went on for a while until checking time came again. This time it was a more serious proposition and I went into it a little more closely and found that my production sheet and my shipping sheets were not checking up after all. An investigation showed a shortage of close to 100 dozen, and they could not be accounted for. Yarn, waste, and goods in process would not check with goods paid for on the payroll.

Now, standing around was as useless as a pig trying to catch the end of his tail. More than this must be done, and done quickly, but it could not come quickly, it could come only through eternal vigilance and persistent effort. There were times when I knew that I was paying for more than I was getting, but I could not help it. It looked as though the whole thing was framed up. One operator would swear by the other operator's count, and there I was. I did not know which way to go, though I knew I was being robbed every day. Oh, yes, I re-counted their work and I hired honest men to help me out, just as others are doing today, but that did not stop the leaks. But I kept up the head-scratching process, still I didn't lose my hair. I scratched deeper than the roots of the hair, and finally found a system that, while not absolutely perfect and fool-proof, is almost fool-proof, for no fool will attempt to get by with it. Now and then some who think they are very smart attempt it only to get caught. Here I will try to give in detail this system, which has been tried out in many ways, and which to date has proven the best I have seen

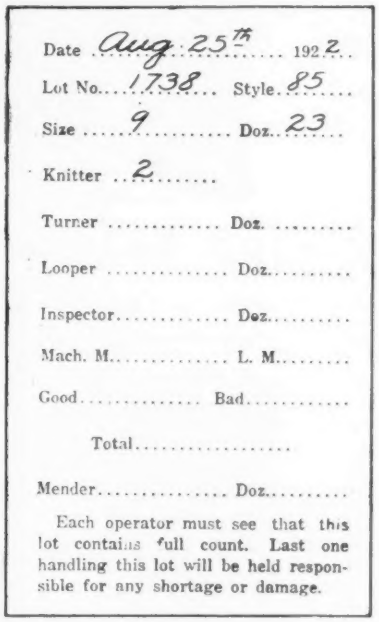
Date Aug. 25th 192 2.
Lot No. 1738 Style 85
Size 9 Doz. 23
Knitter 2
Turner Doz.
Looper Doz.
Inspector Doz.
Mach. M. L. M.
Good Bad
Total
Mender Doz.
Each operator must see that this lot contains full count. Last one handling this lot will be held responsible for any shortage or damage.

FIG. 2

anywhere; there may be better ones, which I have not seen.

If I were to name this system, I would call it a "Permanent Record or Inventory of Goods in Process." In writing this description it shall be my purpose to make it as brief as possible and at the same time give it in detail. In so doing I shall take an actual illustration of a certain lot of hosiery as it went through the mill from the knitter, to the box, and will show samples of the tags, tickets, and records as kept in the office of each process as reported by each operator each day.

The tag shown at Figure 1 is attached to the lot of work, and is shown with all the information required filled out on one side. As this lot, No. 1738, was taken from Knitter No. 2, this lot contained 23 dozen of ladies' hose, size 9, style 85, weight 30 pounds. This lot, with this much of the information shown on the tag, was taken from the knitter by the time keeper and counted and placed in a bag, this tag being fastened to the bag and a ticket

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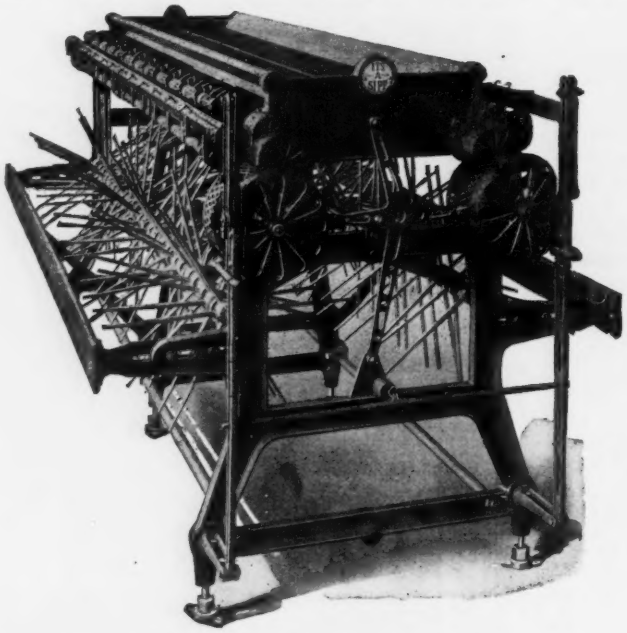

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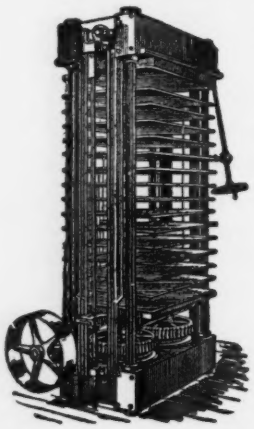
METHOD OF SHIPMENT. Machines are shipped set up complete in sections, it being only necessary to couple sections together when received.
There are many other features. Write for circular giving further details.
Also manufacturer of 6 yd. and 8 yd. Warpers.

Quillers Reels Raschel Warpers and other silk machinery.

THE SIPP MACHINE CO., PATERSON, N. J.



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DATE	LOT	STYLE	SIZE	DOZEN	KNITTER	TURNER	DATE	LOOPER	DATE	INSPECTOR	DATE	MACHINE MENDERS	LOOPER MENDERS	TOTAL MENDERS	THIRDS	MENDER	DATE	WEIGHT POUNDS
8/25	1738	85	9	23	2	26	8/25	11	10/11	38	10/13	1/1	2	1/3	2	42	10/16	30

FIG. 3

or time slip, such as is shown in Fig. 2, was made out by the time keeper, one being given to the knitter and the other delivered to the office, where the information thereon is placed in the office record book, a sample page of which is shown in the illustration in Figure 3.

Now when this lot goes to the turner, he is required to count not only the dozens, but the stockings in the dozens, and if there is a shortage he must go to the knitter and get enough to make up the amount indicated. He then is required to place these back into the bag, after completing his operation, and write his number on the tag attached to the bag. Thus, in the lot being used for illustration, Turner 26 did the work. The turner, and in fact every operator, is furnished with the loose slips (Fig. 2) which are duplicates of the tag, and each fills in the same information on these slips that he puts on the work-tag, retaining one of these, and sending the other to the office, where the information is transferred to the office record book, occupying the next two columns, and also showing the date the work was done. Thus the work is recorded in the office after each operation.

The lot is now passed on to the looper, who, before beginning operations, counts the dozens in the bag, and if a shortage appears, reports back to the turner who handled it, and gets things straightened out before going further. The looper not only counts her dozens, but must count each stocking and see that each bundle or dozen contains 24 stockings.

After the lot is looped and counted, the looper adds her operator's number to the tag, and makes out her tickets in duplicate, one going to the office, the operator keeping one for her own reference. The office record now shows who looped this lot. Thus, Looper 11 did the work on Lot 1738, the case in hand.

The inspecting being the next operation, the inspector proceeds first of all, as in the previous operations, to count the bundles or dozens, in the lot; her count corresponding to that of the looper and those who previously had the lot, she inspects the goods and counts the hose in each dozen. This inspector is required to make a record, on the tag accompanying the work, of all the different kinds of bad work she finds in the lot, as is shown on the accompanying tag for the case in hand, after she has added her number. Thus in this lot there were one and one-twenty-fourth dozens to be mended which were machine mends, and two twenty-fourths dozen looper mends, total mends one and three-twenty-fourth dozens, making twenty-one and twenty-one twenty-fourth dozens good, thus making the total of twenty-three dozen, the full count of the lot.

The inspector then makes out the two tickets in duplicate, as have the other operators, sending one to the office, from which the information is transferred to the office record. In this case it will be noted that this was not inspected until the following month. This delay was probably caused by the inspecting department being behind or some other reason, but that is just the point. With this system, at any time this particular lot of goods is wanted, it can be located immediately by referring to the office record—without having to ransack the whole mill and have all the operatives stop their work and call in the fire department to help locate the lost lot. You will note for convenience in our office record we place "dozens" in the upper left-hand corner of the space, and "odds" in the lower right-hand corner. This not only saves space, but time as well, and is very easily understood by all concerned.

The lot now passes to the mender, and she, after they are mended, places those she has mended in the bag, and adds her number to the tag, also making out her ticket in duplicate, as before. (In this particular case, the operator's ticket sent to the office showed two stockings short, but this was really not a shortage, these two stockings being too bad to mend and being replaced by good ones from the knitter who made them; the office record shows these two as "thirds" only as data showing the approximate amount of this class of work made. These were too bad to be mended, hence they do not appear on the mender's ticket, Fig. 4. You will also note from this that each operator only fills in her operation figures, the lot and style number and the date.

This fills up the one side of the work tag, and the other side of the tag is used for the further processes. This

DYER	DATE	COLOR	BOARDER	DATE	INSPECTOR	DATE	FIRSTS	SECONDS	RE-DYES	MENDS	SHORTAGE	OVERAGE	PAIRER	DATE	STAMPER	DATE	FOLDER	DATE	BOXER	DATE
X	10/17	Blk	61	10/18	54	11/19	22 13	11	0	11	0	0	59	11/19	73	11/19	74	11/19	75	11/19

FIG. 6

side of the work tag is shown in Figure 5. The office record being kept on the special book, the information thus far given is recorded on the left-hand page while from now on it will be recorded on the right-hand page, see Fig. 6.

The lot is now passed to the dyeing operation, where the other side of the card is filled in, with the lot and style and size repeated for convenience, together with the date dyed, and the color used. The dyer also fills out duplicate tickets as in the other operations, one of which is sent to the office from which the dyer's initial, the amount of work, the color, and the date, is transferred to the office record.

Passing now to the boarding room, the boarder has no trouble in counting the goods, as he is handling them in multiples of six and twelve. When the lot is boarded, the boarder adds his number to the tag, and makes his tickets in duplicate, giving the same information with the date added, and this information is recorded in the office.

Going next to the second inspector, the goods are separated into firsts, seconds, thirds, or re-dyes, and whatever mends may be found and classed each to its proper place. Thus, after this operation we find a full report of the lot. This lot was inspected by No. 54, on October 19th, and contained twenty-two and eleven-twenty-fourths dozen firsts, one and two twenty-fourths dozen seconds, no re-dyes, eleven stockings to be mended, with no shortage and no overage.

It will be noticed from Fig. 7 that the inspectors are required to make out reports in full detail, as on these reports we depend on checking back to get the full count on all previous handlings. Not only does the inspector's report check back on previous handlings, but all later counts are

Date 10/16 ..... 192 2

Lot No. 1738 Style 85

Size ..... Doz.....

Knitter .....

Turner ..... Doz. .....

Looper ..... Doz.....

Inspector ..... Doz.....

Mach. M..... L. M.....

Good..... Bad.....

Total.....

Mender 42 Doz. 1- 1/24

Each operator must see that this lot contains full count. Last one handling this lot will be held responsible for any shortage or damage.

FIG. 4

Date 11/19 ..... 192 2

Lot No. 1738 Style 85

Size 9 Doz. 23

Dyer X Color Blk

Boarder 61 Doz. 23

Inspector 54 Doz. 23

Pairer 59 Doz. 23

Stamper 73 Doz. 23

Folder 74 Doz. 23

Boxer 75 Doz. 23

First 22 13/24 Seconds 11/24

Redyes 0 Short 0

Overage 0 Total 23

FIG. 5

checked back to the inspector's count, as she is the last one who handles and counts the whole lot.

From the inspector the lot goes to the pairer, who, after finishing her operation, adds her number to the tag, and makes out the tickets in duplicate, adding the date, for the office record.

Now the stamper gets the lot, and here again the operator is required to make reports as before, adding her number to the tag, and making out her tickets in duplicate, adding the date.

We now come to the folder, who likewise adds her number to the tag, and makes out the duplicate tickets, adding

Date	10/13 192 2	Date	11/19 192 2
Lot No.	1738 Style 85	Lot No.	1738 Style 85
Size	9 Doz. 23	Size	9 Doz. 23
Knitter	2	Dyer	X Color BLK
Turner	26 Doz. 23	Boarder	61 Doz. 23
Looper	11 Doz. 23	Inspector	54 Doz. 23
Inspector	38 Doz. 23	Pairer	Doz.
Mach. M.	1-1/24 L. M. 2/24	Stamper	Doz.
Good	21-2/24 Bad 1-3/24	Folder	Doz.
Total	23	Boxer	Doz.
Mender	Doz.	First	22-13/24 Seconds 11/24
Each operator must see that this lot contains full count. Last one handling this lot will be held responsible for any shortage or damage.		Redyes	0 Short 0
		Overage	0 Total 23

FIG. 7

the date, bringing the office record up to date.

Next is the handling of the lot by the boxer, and here also we find the record made out as before, the operator adding her number to the tag, and making out the duplicate tickets with the date on them. The boxer is also required to mark the lot number on the bottom of the box, which gives a reference and if at any time there be a complaint, we can trace back to any operation and locate the cause of the trouble.

Not only does this system give a complete record and reference at any time, but a man can locate the whereabouts of any goods in process, and, furthermore, we have an automatic inventory of goods in process at all times. We do not have to go out of the office to get the desired information. If the secretary wants to know how much bad work, or what percentage of the work is running bad, he can locate just what he wants here in this book record, and do it quickly.

I have had men working for me who have worked elsewhere, tell me that this system is the most fair in its dealings with the employee they have ever seen. And what can be fairer? Here is a man, we'll say, in the boarding room, who has boarded a lot of hose and sent in his ticket for it, and the ticket has been checked to his credit in the records. He has his duplicate and his number appears on the tag. But in a few days another ticket turns up in the office, and when the checking begins, we find that this lot has been done. We naturally go back to the man who sends in the last ticket, only to find sometimes that the number on the tag was misread, or that perhaps two men worked on the same lot, or that the man may be trying to slip something over on us. In any case a reference to the tag will solve the whole matter, and after this system has been used for a while, the operatives will not try to put anything over, for it is too easy to catch them, and they soon find it out. If an error is made in the office in making out the time, the operator has only to bring his duplicate tickets and check against the originals, and the matter is settled to the satisfaction of both. The employee does not go away feeling that he has been cheated, and the office does not feel that this fellow is always raising a row over his time.

As an instance, some time ago one of our older men turned in a ticket for five dozen, and just to show how easy it is for such things to occur, the office overlooked this in the checking, and the ticket was made out and sent to the office and checked in and filed as correct, but when the time was made up the operator's time and the office time differed twenty dozen. The tickets were laid out and checked one against the other, and it was found that the operator had made out his own ticket for 25 dozen while on the office ticket he had placed only 5. This was not only an error on his part, but the office had erred in that it, too, had not checked his dozens. I do not claim for this system a cure-all or the height of perfection, but it is the best I have seen.

The best of it all, so far as its real worth is concerned, is that where it is impossible for the superintendent or foreman to see all the work that is being done, he can refer to records and get the dope on any operator or operation. Otherwise it would take a day or two to get what he wants.

I left a mill a few years ago where this system was used, and the new man there of course wanted to change the system, and he did, but in the short space of three months he found that one knitter had received pay for one hundred and fifty dozen in short counts, and not only the knitter, but no one was counting, and the loopers also and the inspectors came in for theirs in the round-up.

One of my men came to me one day after he had been caught in an error or two and asked, "Isn't this a great deal more trouble?" I answered, "This is more trouble, but you know where the trouble's at."

The mill that is trying to get along in a careless way is having these losses and troubles, and in some cases they know it but cannot locate it. If I am to have a loss I want to know all about it and be in a position to deal with it squarely rather than to spend days and weeks and maybe months trying to find out where to start.

I hope this description may be of use to some, and will be glad to take the matter up further with any mill interested in the installation of this system.

P. T. E. (N. C.)

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Loading Up and Making Drop Stitches.

EDITOR COTTON:

Regarding trouble with the H-H Scott & Williams machine loading up, about which someone asked a question recently in "Knitting Kinks."

When the machine starts in to make up, if the top yarn fails to fall in, after the machine has run a few rounds, it then catches the yarn in and causes it to load up. The fingers should be adjusted so that the yarn does not come in too late. If this trouble occurs, try drawing the drum forward to make the yarn drop in earlier.

G. B. (N. C.)

Clippers Not Allowed To Get Work — Issued — Seamers Not Allowed To Get Work

Clippers

Clipper	1	2	3	4	5	6		
7								
8								
9								
10								
11								
12								
12:30								
1:30								
2 30								
3 30								
4:30								
5								
TOTAL								

Clippers Will Not Receive Over 20 Dozen per Hour

Seamers

Seamer	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
7															
8															
9															
10															
11															
12															
1.30															
2.30															
3:30															
4 30															
5															
TOTAL															

Seamers Will Not Receive Over 10 Dozen Per Hour

The Form Used to Check and Limit the Work of the Clippers and Seamers.

Piece Work With a Limit on Quantity.

EDITOR COTTON:

To make a haphazard guess at it, I should say that ninety per cent of the mills in this country pay by the piece, unreservedly, for everything in the mill where they can apply the piece rate system. Yes, I've even heard of paying fixers by the piece, and if the readers won't throw too many word-bricks at me for trying to be funny, I'll add that sometimes a superintendent is under this system too, for he must "keep peace" or else lose his job.

Seriously, though, in connection with this piece-work proposition, while it undoubtedly is a good thing, I wonder if we remember there is a possibility of "working a good horse to death?"—sacrificing quality for production.

Many mills, I understand, pay menders by piece, straight, letting them "do their stuff" as fast as they can, go grab up another armful out of a truck and go to it again. At the mill where I now am superintendent, we do not do it in that manner. I make fine gauge silk hosiery for ladies, and I cannot see the wisdom in "sweating blood" to get the goods through the mill in perfect condition, and then taking any chance on putting sour milk in the coffee at one of the final processes.

The accompanying form shows the method we use at this process. This is a report turned into the office at the end of each day. As will be noted therein, our clippers and seamers are not allowed to get their own work. I think enough of the plan so that I pay a man to issue the work to these operators. Furthermore, on the clipper side of the sheet, you will note the statement, "Clippers Will Not Receive Over 20 Dozen Per Hour," and in the center, "Seamers Will Not Receive Over 10 Dozen Per Hour." We have made some tests and have found that if the workers attempt to handle more than these numbers, it shows up in bad goods. Our man gets the work and allots it as per this regulation, as I have stated. At each hour (shown in the vertical column) he gives a girl so many dozen, and marks it down under her number (shown in the horizontal column across the sheet). If a girl receives 20 dozen to clip at 7:00 o'clock, she cannot get any more until 8:00 o'clock, and cannot get any then unless she has finished the first lot. Same way with the seamers.

At the close of the day, each operator's work is totaled up and her time made up from it. Yes, we pay by the piece, so much per dozen, but don't you see our benefit? The girl knows it won't do her any good to rush through a lot, and so she takes pains and does the job neatly. We have established a rate so that our operators make as much in this manner, as do the operators at other mills on the old plan, because they get steady work all the way through. It doesn't cost us a cent more in the long run because we get the work done *right*.

I hope this may have a suggestion in it for some brother superintendent who is worrying over this business. Please don't think I'm opposed to piece-work. I use it. But in this particular instance I find it is better to use some additional caution. L. N. (Tenn.)

What Makes Knots or Tangles in the Double Sole?

EDITOR COTTON:

I would like to ask the following question to be answered by your practical knitter readers:

In making a half-hose of artificial silk, no plaiting, with high splice and double sole of cotton or mercerized, we have trouble with the double sole knotting or tangling up, and when clipped out on the double sole clipper, this would

pull holes in the corner of the gore of the heel, and also often would tear loose while it was running in the machine.

We adjusted the cut-off knives that work the yarn shearer so that it would clip at the proper time and place, and still this trouble would continue. This is on a Scott & Williams B-5 machine, on 200 and 220-needle work. If any readers can suggest anything to prevent this I shall appreciate it. M. L. D. (N. C.)

Art Silk Sloughs Off and Makes Waste.

EDITOR COTTON:

Here is a problem we want help on. We use a wood fiber artificial silk. Sometimes, after a Sunday shut-down, or even after a damp spell, when we start up in the morning we find the bobbins of artificial silk have sort of sloughed off the top of the bobbin; that is, the top layers seem to have risen up toward the top of the cone. This of course causes considerable waste.

We receive this artificial silk in packages, and put it in a net bag and treat it in a vat for 20 minutes in an equal solution of artificial silk oil and kerosene, then it is hydro-extracted for 45 minutes and then wound for use on the knitting machines.

If anyone can suggest some change in our method, or something to prevent this waste, we shall appreciate it.

Contributor No. 3790.

Knot Catcher for R I Machines.

EDITOR COTTON:

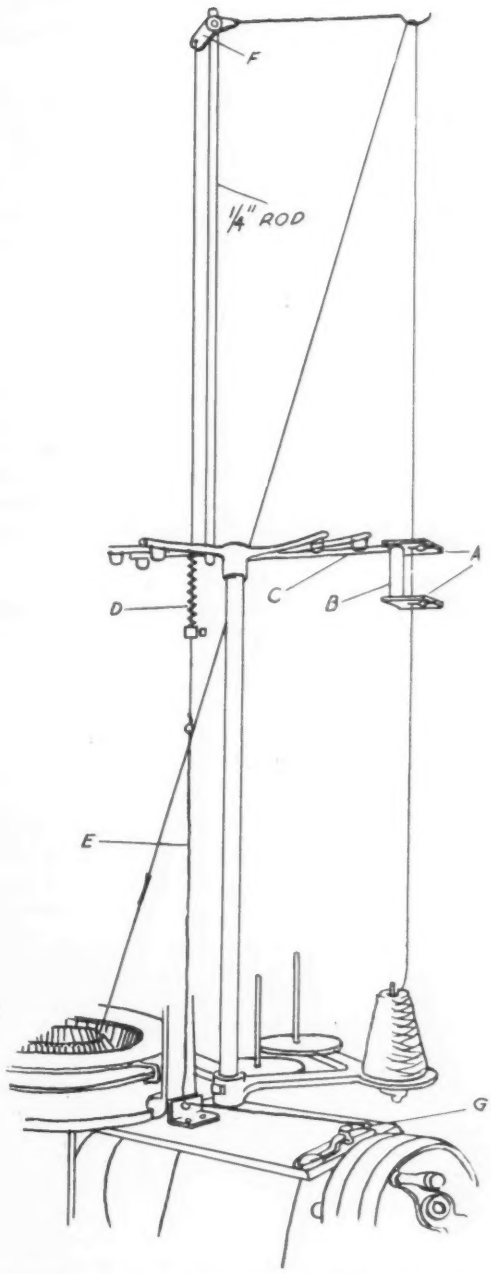
A great deal of cutting out is caused by knots on the Scott & Williams R I machine, due to the fact that the machine knits on two sets of needles—cylinder and dial. If some means is not provided for stopping these knots before they get into the machine, the result is cut-outs.

In the accompanying illustration is shown an effective stop-motion for catching the knots and slubs of yarn before they get into the machine. This stop-motion is very simple and effective, and it costs only a few cents to make and install on the machine.

The knot catcher is shown at *A*. It consists merely of a small plate in which a slot has been cut with a hack saw. Another small plate is screwed onto this plate with one screw hole. This small plate can be moved back and forth to regulate the width of the slotted hole. This plate is screwed to the end of the stud yarn tension. Two of these knot catchers can be used on each machine, one being screwed on each end of the stud yarn tension, making the stop more positive.

This is mounted on the top of the regular top yarn guide *C*. A ¼-inch rod extending up from the yarn stand has connected to its top the regular take-up lever. *F*, from one side of which extends a wire as shown, over which the yarn passes. Connected to the other end of the take-up lever is a wire which extends through a hole drilled in the yarn guide. The coil spring *D* rests against the bottom of the yarn guide on one end, and is set-screwed to the wire at the other end, according to the tension desired. Then a hard-twisted string *E* is joined to the lower end of this wire.

The string, which is tied to the lower end of the wire, passes through a hole in the stop actuating finger bracket,



and from there is tied onto one end of the stop actuating finger.

When a knot is caught in the knot catcher *A*, the thread tightens under the tension and pulls down on the wire guide until the yarn slips off the end of the open hook, causing the guide to go downward, which raises the vertical wire attached to the end of the take-up lever. This also raises the string *E*, which is attached to the stop actuating finger. The upward pull on the string pulls sidewise on the stop actuating finger, which in turn disconnects the end of the stop actuating lever *G*, swinging one end of the stop actuating lever into the pulley and disconnecting the pulley from the main driving gear. All standard Scott & Williams machines are equipped with this pulley and stopping

device, so that the workings of the driving pulley, stop actuating finger and lever are understood by all familiar with these machines.

The coil spring used should be snappy, but not too stiff. The set-screw for this spring should be set down low enough from the top yarn guide to allow of a full throw of the wire guide; otherwise the thread will pull out of the machine.

If any of your readers who may be interested in this device desire to ask further questions, I shall be glad to answer them. RYMI.

Causes for Stitches Riding the Sinkers.

EDITOR COTTON:

In January "Knitting Kinks," a man in North Carolina asked what is a remedy for stitches riding the sinkers on a Standard B, 176-needle, 3¾-inch machine, just passing out of the heel. I could help him better if I could go over his machine, but as that is impossible, here are some suggestions for him, and others who may be having this trouble:

I suspect he would find on examination that his sinkers are worn causing too much play, and the best remedy would be to put in a new sinker head. However, I believe he will find relief by putting a cylinder band wire on there, not too tight, but just enough to keep the sinkers pulled in all the time.

I have helped this also by hollowing out the cam a little, not letting the sinkers have such a slant; so they will go in at a quicker angle, so to speak.

If this man tries these suggestions and still wants some help, let him write "Knitting Kinks" again and we'll go into the matter further. W. C. T. (N. C.)

EDITOR COTTON:

In answering "J. K. L.'s" questions regarding the stitches riding the sinkers on a Standard B machine, as published in the January issue of "Knitting Kinks," permit me to offer the following suggestions:

First, remove the sinker head and cylinder and clean the levers of all lint. Possibly, also, a piece of needle has gotten in there. Be sure the levers are clear of all foreign particles. Then be certain the levers line up with the cylinder. There is a possibility that the levers need going over and all the bad ones taken out. If the levers are not properly lined they will not hold the needles in place while the machine is making the heel, and this will cause the stitches to ride the sinkers. However, the yarn carrier can be set too close, which will make the needles rise upward when the levers throw them out of operation.

But there's no getting around the necessity of putting the levers in first-class shape. A good way to do this is to take the levers from each machine and put them on a gauge similar to the one described in my letter entitled, "A Gauge for Fitting Levers on a Standard F Machine." (This article appears in this issue of "Knitting Kinks."—Editor.)

I believe a man will be surprised, if he puts the levers on this gauge, to find out how much out of line they are. The article referred to explains the way to make and use this gauge.

After setting up the levers to a gauge and after replacing them where necessity demands, and finding the levers can be worked with the fingers, the next thing to do is to take a small hammer and tap the lever bed so as to make the levers tight. This will make a great difference.

Of course great care should be exercised in doing a job of this kind. I think if the suggestions herewith are carried out, much satisfaction will be gained. If "J. K. L." will fit up a cam box and be sure the stitch cams draw the same, and will fit the levers to the gauge, then I am confident he will find play in the sinker cap. Then let him assemble the sinker cap and tighten the nuts down and then put the cap on a table and with his finger see if he can detect play or see if the sinkers can be raised upward. I am sure he can unless he has new sinker caps and new sinkers. Now let him take the sinker cap to the shop and have some cut off—possibly 1/64-inch. That will help it. If he hasn't a lathe, let him take a piece of cylinder band and make a band that will go around the sinkers. This will help, too.

I hope "J. K. L." will try these suggestions and let us know how he comes out. I have done these things many times and was glad afterward.

The reader may think this is a lot of trouble, and I know it is some job, but I believe it will reduce the gore holes or cut holes and stitches riding the sinkers down to a very few.

In closing let me advise "J. K. L." not to make the heels too tight. W. H. H. (GA.)

Why the Hooks Break.

EDITOR COTTON:

As to "What Makes the Hooks Break?" as asked by "Contributor No. 3670" in the January issue of "Knitting Kinks," I will say I have had this trouble, and herewith are some of my conclusions:

Sometimes a fixer will put so much tension on the spring that operates the needle lifter that it will cause the needles to crystallize and then of course they will break. Also, if the needle pick is rough underneath this trouble will result. He should have the stitch cam come to a point properly and not be ground out to a point, for if the point comes under the outer edge of the butt, it will "cock" the needle over, so to speak, and break the hook.

T. R. Y. (N. C.)

Overcoming a Looper Trouble.

EDITOR COTTON:

I'm going to tell one on myself—a case where I couldn't find out what was the matter and had to call in outside help. It was on a Hepworth looper. We had one machine that would leave off stitches. It wouldn't skip, but it would leave off on both sides. I worked and worked and worked on it. You know the Hepworth looper has a brake on it with a little leather piece on it to brake the dial. I thought this was the cause, but the trouble continued after I had this so the dial wouldn't slip.

Then I asked one of our men what might be the trouble. He said, "Is the brake tight?" "It is," I answered. "Then I know what's wrong," he replied, "Gimme your screwdriver."

As you know, the Hepworth machine, in addition to the brake, has another locking screw, with a piece of leather

on the bottom of it, about half way between the center and outer edge of the dial. This man took this screw out and removed the leather, which was worn, and took a small piece of round leather belt and replaced it. and we had no more of the trouble. It seemed that when this leather had become worn, the play that was in the gears turning the dial caused the needle ring to slide back and forth in making the stitch so that the stitches occasionally would be left off. But that's the last place I would have thought of to investigate! G. H. S. (N. C.)

What Makes the Latches Stick?

EDITOR COTTON:

Our biggest difficulty right now is on our George D. Mayo machines. In the mornings, when we oil the machines. we have a lot of trouble with the latches sticking, causing drop stitches in the transfer work. We put a small quantity of oil in the sinker ring early in the morning. The latches fly up and stick and on the transfer they won't go down and the stitch slides off the latch instead of pulling the latch. We have tried many different kinds of oil, and have the trouble with all of them. The trouble lasts for an hour or so after oiling and then the machine gets all right. In the meantime we have the drop stitches. If anyone can suggest a remedy I shall appreciate it.

D. M. T. (N. C.)

A Gauge for Fitting Levers on a Standard F Machine.

EDITOR COTTON:

In "Knitting Kinks" in the August issue, someone referred to the old Standards machines. Allow me to say that the old Standards are still good. Over 23 years ago I went into a mill for a job; it was my first time in a textile mill. I saw a row of things on four legs with some yarn on them. I saw something going around and around. stopping suddenly and going but half way around. Of course I knew it was a knitting machine, but in a few days I learned it was an old "Standard *B*." And today the same old machines are turning out work just like they did the first time I saw them.

Shortly after this along came the Standard F, a speedier machine than the B. By this time I was fixing or learning to fix. I watched the other fellows and tried out some things myself, and profited by both.

Fixing knitting machines is a trade and is hard to master. But there's no use for us to be selfish with our findings. COTTON has a place for our ideas. At our mill we look for COTTON, and when it comes "Knitting Kinks" is the first thing we turn to, looking for the other fellow's ideas. It doesn't matter how much you know; someone else may know a trick or a shorter way to do the same thing. To bear out my statement, during dinner hour at a mill shop the fellows were looking at some new pulleys that had just come in, and we were looking to see if we could find a flaw of any kind. One of the fellows said, "Why is it that the set screws in most all pulleys are tight set screws?" "Why," said someone, "our set screws don't fit tight." A general discussion followed, and one fellow who wasn't connected with the shop said, "I can tell you. Always use oil on cast iron when tapping for a tight fit for set screws." It was tried out and found to be a fact.

We should not make fun of the other fellow, but should let it appear that he is helping us, and maybe in an hour or so he can tell us something that we do not know. We all know that no one man on this earth knows it all—especially about knitting, so lets write it down. COTTON is always ready to do its part. Let's ask questions—somebody will answer them.

Now getting back to the Standard F machine, I am sending some drawings that may be of interest, in regard to

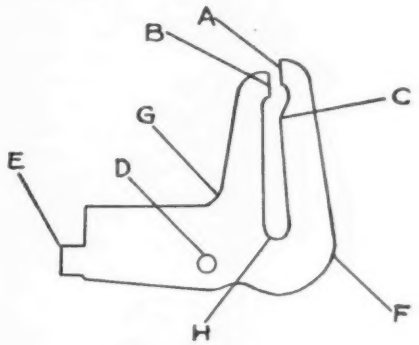


Fig. 1. The Lever.

levers on this machine, and also how to make a lever gauge. Figure 1 shows a lever for a Standard F machine. *A* and *B* are the faces of the lever, and *C* shows the shoulder. These points are very important. Note in Figure 4 the correct way for the needle to fit the lever. The lower faces must be square in order to prevent the needle from shooting up. However, face *A* will stand a little more wear than the other points. It should be borne in mind that if the faces are kept square the needles won't shoot up and cut, break the machine down and no telling what else.

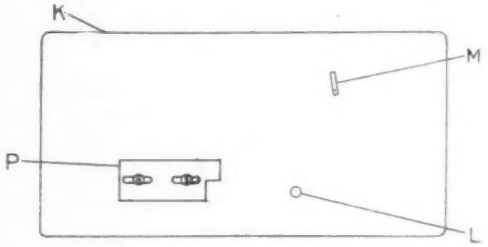


Fig. 2. The Gauge.

Now suppose we put in a new set of levers, and after a few days the machine gives trouble. We had better look at the levers. Which ones shall we look at? The new ones, of course! Because one might have got by without being

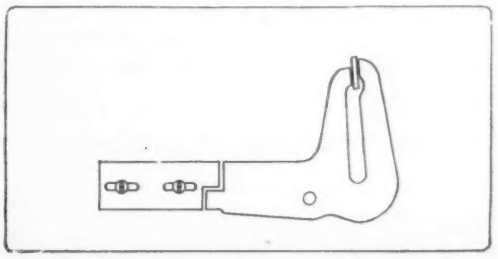


Fig. 3. The Gauge with the Lever in Place.

FALLS

in mills, both on stairs and on the level, are responsible for a very high percentage of fatalities and of lost time claims. One fatality in the course of a year results in a big increase in compensation insurance. The loss of trained workmen even for a day slows up production.

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tempered. If we find the levers okeh, the next thing is to see that the cylinder lines up with the levers.

As stated, the needles must go in the levers centrally, as shown at Figure 4. A butt of a needle sometimes causes the levers to be sprung out of line. Because when the machines go on the heel the levers are worked and the butt of a broken needle being stiff is the reason for the lever being sprung. If the fixer watches the machine he will at once decide there is something wrong with the levers. He removes the cylinder and finds the needle butt and gets it out. But the chances are he won't see if the cylinder lines up. *The fixer must look after these things; they are important.*

Now suppose we were a Standard fixer. If we were going to put in a new set of levers, would we polish them so they would slip in the slots loose or tight? I am speaking of the entire set.

I believe that 90 per cent of the Standard fixers put the levers in loose, especially the back levers. I did until I found out this was wrong. Suppose we are putting in a new set, let's first tap the levers in with a small hammer, using judgment. After putting in the levers, let's start up the machine and tie up the leveler lever so the machine will level the needles all the time. We want to use a good cup grease, and run the machine until the levers have worked to a snug fit. Sometimes it takes 20 hours.

Now suppose we have a set that's loose, and no new levers in stock. Let's take a ball peen hammer and tap the lever bed, tightening the levers very tight, and then use the process just described.

It is not reasonable to suppose that a fixer can have new levers all the time as they are expensive, and therefore

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I will next describe in detail a lever gauge which ought to prove profitable to machine fixers, as they can make it themselves. It is shown in Figure 2.

In this drawing, *K* is a piece of flat iron, ½ inch thick, 2 inches wide, and 4 inches long. *L* is a pin screwed into the flat iron, and is intended to fit the hole *D* in the lever, Figure 1. The pin at *M* is filed off flat on both sides, and is to fit into a new lever. (See *A* and *B*, Figure 1.) It is screwed into the flat iron. *P* shows a small piece of flat iron that has two slots large enough for ¼-inch screws, and is to fit *E*, Figure 1. This piece is slotted so that it can be adjusted in both front and back levers. It is fastened on with ordinary screws.

Now we have a lever gauge. Let's look over our discarded levers and select the best one, noticing the shoulders. Now we'll place the lever on the gauge, as shown in Figure 3. If the faces are opened larger than the pin *M* in Figure 2, we will take a ball peen hammer, and if the high side of the lever needs to go in we will tap sharply at *F* in Figure 1. Or if the short side needs to go in, we will tap on the lever at *G*, Figure 1. If the lever faces are too tight, or won't go on, we will tap at *H*, Figure 1.

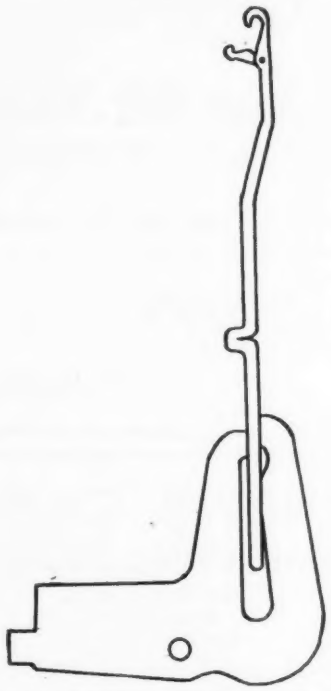


Fig. 4. Showing the Correct Way for the Needle to Fit the Lever.

All this takes time, but it's worth while, as we can recover a good many levers that would otherwise be discarded. I am preparing an article on cams and cam boxes that I hope will be interesting. Let's all discuss our findings in "Knitting Kinks." W. H. H. (GA.)

Dyeing Fiber Plaited Hosiery.

EDITOR COTTON:

I notice in the January section of "Knitting Kinks" where a correspondent is having trouble dyeing a fiber plaited sock. I wish to advise this correspondent through your columns that satisfactory dyeing cannot be done at a low temperature. We have given this method a fair trial and spent considerable money on it, but always failed. The only way we believe he will be able to get his goods freed from streaks is to boil them while dyeing.

R. O. (ALA.)

The Sulphur Black Bleeds.

EDITOR COTTON:

I have a problem in dyeing I should like to have discussed in "Knitting Kinks." We are making an artificial silk and mercerized plaited half-hose. I use the regular standing bath, with seven per cent sulphur black dye, six per cent sulphide, and six per cent of sheet glue, to keep the sulphur black off the artificial silk. I boil at 185 degrees F. for an hour, then run out the liquor and boil goods for about 15 minutes in a solution of three per cent pure green olive soap and water.

I am having trouble with the sulphur black bleeding after the soap bath. If any readers can make any suggestions that will help I shall appreciate it.

D. D. W. (N. C.)

Asks Suggestions on Broken Butts.

EDITOR COTTON:

We are having some expensive trouble with the butts being broken off our needles, on Scott & Williams K machines, when the stocking is in the heel. We use a 48-gauge needle on 200-needle mercerized work. The pick hits the needle, and instead of raising it, breaks the butt off. Someone suggested it might be that the cylinder walls are bent, but we put in brand-new walls and still have the trouble.

Any information will be thankfully received.

Contributor No. 722.

How Can These Oil Spots Be Prevented?

EDITOR COTTON:

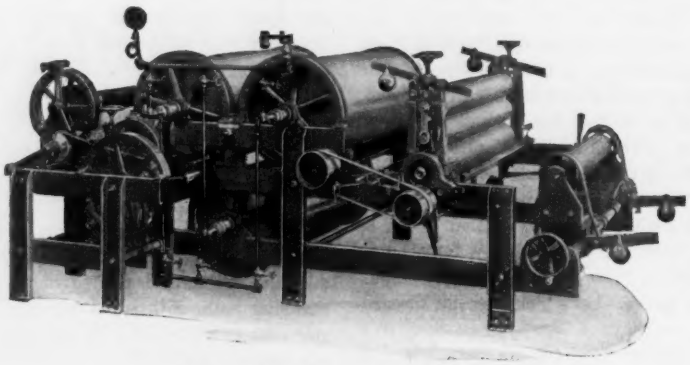
We are manufacturers of 220-needle half-hose and have heretofore knit all of our goods in the grey, but we are beginning the manufacture of ingrain goods, and we would like to have the benefit of the advice of the readers of "Knitting Kinks" as to the best method of lubricating the cylinders and needles of the knitting machines so as to avoid oil spots on the goods, and especially to avoid that streak across the heel which is caused when the long butt needles are raised and any dirt on the needles is wiped off on the yarn. G. B. (TENN.)

Back Seaming Machine Breaks Needles.

EDITOR COTTON:

Will some readers of "Knitting Kinks" discuss what are the causes for needle breakage on a Union Special back seaming machine? I think we are having too many broken needles, but do not know anything to do. Will some readers please outline the possible causes for this trouble, so that I may have something to work on. On six machines, for the past 13 days—double shift—we have had 50 broken needles, and I think that's too many. Our speed is 3,300. Contributor No. 724.

ATTENTION! Mill Men now using or who contemplate using Artificial Silk



in weaving should investigate machine shown here. Many now in use. Communicate.

Sizing Machine No. 81—Type M.

Machine for Sizing Artificial and Spun Silk Warps

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Fall River, Mass., O. S. Hawes & Bro., 38 Rock Street.
Toronto, Canada, Slater & Company, 53 Yonge Street.

A Softener Containing Olive Oil.

EDITOR COTTON:

As a softener for cotton hosiery, we use 40 pounds of commercial olive oil soap; four gallons of liquid olive oil in a 50-gallon barrel of water. We dissolve the soap in boiling water, then add the olive oil, and stir it up.

This is in partial answer to your subscriber who wanted a softener for cotton and cotton-and-wool hosiery. I don't know how this would work on the combination goods, but it is entirely satisfactory for us on cotton work. For a while we bought a prepared softener, paying five cents a pound for it, but now we find we can make this up for about a cent and a quarter a pound. G. H. S. (N. C.)

What Causes the Drop Stitches?

EDITOR COTTON:

We are making a ladies' underwear, using a 50s cotton yarn, and putting in one stripe of artificial silk to eight feeds. We have difficulty with drop stitches on the artificial silk, which must be run on top and without any tension. I should appreciate it if some reader of your "Knitting Kinks" who has had experience on this kind of work would suggest how we can overcome these drop stitches.

CONTRIBUTOR No. 735.

Reducing the Weight of Hosiery.

EDITOR COTTON:

I am running a 60s/2 mercerized yarn, on a 220-needle Scott & Williams machine, making ladies' hosiery weighing about 21 ounces to the dozen from the knitting machine. How may I reduce this to weigh 18 ounces a dozen, from the knitting machine, without changing the yarn or the length of the hose?

This is a problem I should be pleased to have some reader of "Knitting Kinks" solve for me.

P. T. E. (N. C.)

Preventing Cutouts on the Yarn Change.

EDITOR COTTON:

In making very fine gauge work on Model K, Scott & Williams machines, it is necessary to draw a very tight stitch in the foot in order to get a good-looking product. One of the difficulties that result in drawing a tight stitch in the foot is a cut-out on the yarn change just as the machine leaves the heel. This is due to the fact that there are four threads on this change and due to the fact that the stitch is tight, too much strain is put on the stitches at this point, resulting in a cut-out on this change.

This trouble can generally be fixed by having the stitch cam conceaved properly, also the sinker cams set properly, but this does not always stop the trouble. In order to overcome cut-outs on this change, I soldered a piece of tin about a quarter of an inch long on the back end of the drum cam that controls the heel. By so doing, as the machine transfers from the heel to the foot, the cylinder will raise slightly, resulting in a looser stitch right on the yarn change, which releases the strain and prevents a cut-out at this point. Care must be taken to adjust the piece of tin on the yarn drum cam so that the loose stitch will not be on either side of the yarn change, which would spoil the appearance of the work at that point. RYMI.

A Difficulty in Drop Stitch Work.

EDITOR COTTON:

Please publish this question in "Knitting Kinks":

How can I make a pull welt or clearing course on a ribber, making drop stitch work, without additional latches catching up, or two needles knitting together and making an extraordinarily large drop stitch?

If some of your readers with experience on ribbers can tell me how this is done, if it is possible to do it, I shall appreciate it. T. W. T. (N. C.)

Preventing Trouble With a Navy and White Combination.

EDITOR COTTON:

Replying to "Contributor No. 3669." this is a peculiar condition and cannot be replied to in a proper manner without seeing specimens of the dyeings. If the dye stains the silk during the rinse, it would indicate that the navy blue dye used is one of the group of direct dyes that have a staining action in the cold. It seems that the staining of the silk only occurs during the ten minutes rinse. Why not make the experiment of washing with a few pounds of salt in the tub for the first wash and then rinse out the salt in a second water? This course is prompted by the further statement that a dyed hose, removed from the dyebath and washed under a faucet, the result is a clear silk—just what is wished.

His method of dyeing may be proper for the dye he actually uses. If, after trying the salt suggestion, he still continues to get defective results, he should confer with one of the technical men from the firm from whom he procures the particular navy blue. Perhaps this man can suggest a slight alteration in the mixture that will at once clear up the clouding of the silk. G. G. (N. J.)

EDITOR COTTON:

The dyeing problem brought up by "Contributor No. 3699" in January "Knitting Kinks," with regard to the navy blue "running" in the rinse, is interesting. It is a well known fact that navy blue is the hardest dye of any to set. I believe that if he will use a few ounces less of dye and increase the amount of salt his goods will have less tendency to "bleed." He says he is using nine pounds of soap to 75 pounds of goods for softening. That is entirely too much soap. This seems to me to be his main trouble because he says he can take a single hose from the dyebath and hold it under a faucet and it will rinse out nice and clear. I would suggest that he cut the softener to three pounds to 75 pounds of goods. Too much soap will certainly cause goods to "bleed." N. (GA.)

T. F. Flourney, superintendent, Fort Valley (Ga.) Knitting Mills, is chairman of publicity for the Fourth Peach Blossom Festival, an annual event of national importance, attracting thousands of visitors to Fort Valley, which is the largest individual shipping point for peaches in the world.

The Yarn Market

The past month, as reported here, has been a very quiet one for the Philadelphia cotton yarn market. From a general viewpoint, nothing of an exciting or radical nature developed, the conditions prevailing at about the same uninteresting level that has obained in this market for several months past. There seemed a persisting lack of buyers' orders; and naught of encouraging signs from either side of the market.

Whereas the spinners, as an apparent result of more unified endeavor and presenting a solid front, have been conceded as being entitled to the saddle for some time, the trend during the last month indicated more or less a change of control, in that, while nothing drastic occurred, the buying end seemed to be more in position to dictate than did the seller.

This does not mean, however, that the spinners' ranks were in any way dispersed, but rather that underlying conditions were certain to make their effect known under the proverbial law of demand governing, not only supply, but price levels as well. The trade ordinarily consuming yarns out of this market, while by no means a startling example of depression, did find itself outside of any great and grand orgy of prosperity that may have materialized elsewhere from out of the predictions at the first of the year. Business came through, but not in the proportions calculated upon by themselves.

The reflection of this paucity of orders was, naturally, reflected back into the yarn market here, where there seems to be little of a hopeful character until the outlet channels seem opened up again for yarn customers.

Such fluctuations as occurred in yarn rates during the month were apparently the result of the antics of raw cotton quotations, instead of readjustments of market conditions to bring prices into line with any activity in trading, or lack of it. Several times rates for the list went up, and down, but these variations generally were attributed to the strength and loss experienced in the cotton market.

As a rule, however, the close of our period saw the yarn quotations on a lower plane than that upon which they rested more or less nervously during January. This of course was the inevitable result of continued lack of business. Spinners, as a whole, seemed to continue determined to hold out for prices returning to them a margin above cost, and mills were known to reject orders proffered at quotations they knew excluded any profit on their part. Such a stand, it was pointed out, has accomplished and will accomplish more than any other factor the results the spinner has long desired, and, it is believed, the proper coordination of effort in this direction will stabilize conditions in a manner more profitable to all elements of the trade.

That the mills were inclined toward curtailment rather than operation of their plants at a loss seemed indicated by reports from the spinners' territory to the effect that they preferred to close up instead of producing goods for accumulation or disposition without a profit. To this writing no general policy of curtailment has been adopted, but it is predicted for the near future.

Business transacted during the past month consisted principally of hand-to-mouth purchases to fill in immediate orders. Buying for the future seems a forgotten practice just now, practically all orders calling for delivery either immediately, in small lots, or at one or two months ahead at the most.

Carded yarns were much weaker than combed numbers, the latter showing some little activity. This was attributed largely to a belief held in the consuming end of an unusual scarcity of staple cotton used in the production of the combed products.

Following are quotations on the Philadelphia market on February 17th:

Single Skeins.

4s to 8s	37	10s	37 @37½
12s	38 @38½	14s	39
16s	39½	20s	41
24s	44	26s	45
30s	47		

Single Warps.

8s	38	10s	38½ @39
12s	39½	14s	39½ @40
16s	40½	20s	42½
26s	46	30s	47½
40s	53 @54		

Carpet and Upholstery Yarn in Skeins.

8s and 9s 3-4 slack	33
8s 3-4 hard white warp twist	36
8s and 9s 3-4 tinged tube	34
8s 3-4 hard twist waste	33½

Two-Ply Skeins.

8s	37½	10s	38 @38½
12s	39 @39½	14s	40
16s	40½	20s	42
24s	45	26s	45½
30s	47	40s	54

Two-Ply Warps.

8s	38½ @39	10s	39 @39½
12s	40 @40½	14s	40½ @41
16s	41½ @42	20s	42½ @43
24s	46	26s	47
30s	48 @48½	40s	56

Frame Spun Carded Yarn on Cones.

8s	37	10s	37½ @38
12s	38 @38½	14s	38½ @39
16s	39 @39½	18s	39½ @40
20s	40 @40½	22s	41
24s	42	26s	43½
30s	45½	40s	54
30s double carded			45½
30s tying-in			44

Two-Ply Combed Peeler Skeins and Warps.

8s to 16s	55	20s	58
24s	60	30s	65
40s	70	50s	75
60s	83 @85	70s	90
80s	$1.05		

Single Combed Peeler Yarn on Cones.

18s	52½	24s	55
30s	60	36s	65
38s	66	40s	67

Mule Spun Carded Yarn on Cones.

10s	43	12s	44
14s	45	16s	46
18s	47	20s	48
24s	49	26s	50
30s	51	40s	58

Mule Spun Combed Peeler Yarn on Cones.

10s	52	12s	53
14s	54	16s	55
18s	56	20s	57
22s	58	26s	62
28s	63	30s	64
36s	67	38s	70
40s	72		

The Sandoz Chemical Works, Inc., is sending to the trade new insertions to their loose leaf shade cards. These additions illustrate three acid blues, Xylene Cyanol FF, Xylene Blue VS, and Xylene Blue AS, which, it is stated, are of exceptional brightness and purity of shade dyed on worsted yarn and piece goods, and silk piece goods.

The Joseph Dixon Crucible Company, Jersey City, N. J., manufacturers of graphite products, pencils, lubricants, crucibles, and paint, announce the removal of their Boston office from 49 Federal Street to 80 Federal Street, the new Chamber of Commerce Building.

The Universal No. 50 Skein to Cone Winder for Artificial Silk

ARTIFICIAL silk should have as few handlings as possible. As this material does not react from stress as do other yarns, repeated handlings tend to roughen and strain the fibres.

Therefore, the No. 50 Skein to Cone winder is attracting wide attention. With the operation of spooling from skeins eliminated, not only is the cost of preparing artificial silk for knitting machines reduced, but the material is in much better condition than if it had been handled in the spooling process.

The No. 50 Skein to Cone Winder is equipped with a slow starting device that prevents straining the fibre when starting the winding spindle and with a compensating device that controls the swift and maintains a uniform tension on the yarn throughout the winding. Artificial silks of from 75 to 300 denier are handled without difficulty.

The No. 50 5″ traverse cone has long been recognized by knitters as the most satisfactory package from which to deliver artificial silk to knitting machines. The delivery of the silk from the cone to the knitting machine is all that could be desired, in fact, repeated tests have shown that fewer press-offs are experienced from our cones than from any other type of knitting package.

The Universal No. 50 Skein to Cone Winder is recommended for your use with the assurance that in economy and performance, it is worthy of the "Leesona" mark of service—a product of the Universal Winding Company.

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Est. 1866

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The Knit Goods Market

After a busy few weeks in January, trading in all classes of knit goods as a whole was on a somewhat restricted basis last month. It was apparent jobber and retailer were pursuing a conservative policy. The explanation might be found in the fact jobbers were taking in spring goods bought several months ago, while shipments to retailers gave promise of no volume for another month. The latter are reported having taken in practically nothing for spring during January, and were only filling in during February. There was a good attendance of buyers in the primary markets in the first month of the year, and an absence of them in the second, and as they had but returned from their homes, mill salesmen on the road were not wholly disappointed in their limited bookings. A second installment of orders for spring goods is to be expected during March.

One wholesome phase of the quiet hosiery situation is found in apparently lighter stocks among mills. It is noted that of 310 identical manufacturing establishments filing reports for November and December, 36 reported no production during the latter month, while five discontinued business. The value of these statistics is enhanced by the fact that the 310 mills produced almost 70 per cent of the value of the hosiery reported in the 1921 census of manufactures.

Production of hosiery as a whole increased, notwithstanding the number of idle mills, and it appears much of the increase was in the Third Federal Reserve District, which embraces Philadelphia, Reading and all interior Pennsylvania manufacturing centers, and a part of New Jersey. In the territory covered by the report production gained nearly 10 per cent, but shipments increased by almost 17 per cent. There also was an increase of about three per cent in stock in mills at the end of December and a gain of approximately five per cent in unfilled orders. Thus the larger production is about absorbed, and it is obvious stocks will be drawn on heavily for goods to reach retailers by April.

The largest gain in output in the Philadelphia-Reading territory was of boys' and misses' ribs, amounting to 35 per cent, in contrast with 23 per cent for women's seamless and 11 per cent for women's full fashioned. Shipments of women's full fashioned and juvenile goods ran well ahead of production, while orders booked fell off, which was only logical, as much of the spring business had been placed some time before. The one disturbing feature of the report was an increase in cancellations, applying to hosiery as a class, several lines, among them women's seamless and juvenile ribs, showing a material decline.

Hosiery appears to be in a stronger market position than other knit goods lines and textiles generally. This may be ascribed in great measure to activity in novelties, coming out in increasing number for men and women, with the situation as to children's ribs pretty well taken care of in this respect without any additions. But a market crowded with novelties operates toward very restricted buying by distributors. Orders probably will be for small quantities and their pace, in numbers, fast and furious, which will be to the advantage of manufacturers in position to make immediate deliveries and to the disadvantage of jobbers. Many interests look for a radical increase in the number of shipments by express and parcel post. An executive of a large establishment selling the production of several important southern mills sums up as to the near future in this way:

"There is a good market for good hosiery for the better trade, and it will become a better market for financially strong mills which can make deliveries. Manufacturers who cannot finance substantial raw material purchases in their original markets will not be able to make reasonable profits. Those who can put out the best possible goods at the lowest possible price will be able to keep their plants well engaged. So certain are we of our ground that, although orders on the books may not justify it, we are increasing production by overtime operation, assured the business will be coming along in right good volume, so far as we are concerned. Under our policy of greater output and concentrating on certain popular price numbers we have a lower overhead than in many years. Many mills not so fortunately situated in this respect will, in my judgment, find it expedient to discontinue manufacturing for a time, unless they can profitably divert their machinery to other purposes. There is, particularly, a precarious situation for manufacturers who cannot contract with producers for the artificial silk they consume. Those who must buy from silk jobbers seldom get the benefit of the bottom price, and if the reports of a scarcity or underproduction of the fiber are approximately true, they will be worse this year than ever."

That hosiery prices are low to the point of inconsistency is indicated in the fact that they are being maintained in an admittedly quiet market, advances having been recorded on some few lines of full fashioned and seamless silk. Some distress lots of wool hosiery and cheap lines of fiber goods made their appearance last month, but this was nothing unusual. There always are surplus goods in some line or another. Besides, the stage of demand is not to be gauged by that which comes from jobbers and retailers not classed as catalog houses or chain stores. It is pointed out that while jobbers and retailers complained the consumer was economizing, the business of the Woolworth, McCrory and Kresge stores in January gained by 16 to 26 per cent over the corresponding month of 1924—and all sell hosiery, as do Montgomery Ward & Co., who, it may be said in passing, report having sold 1,000,000 more pairs of shoes last year than in 1923. Then, too, there has been a large increase in the sales of manufacturers distributing among consumers through canvassers. The public is buying no less hosiery, but apparently is depending on sources other than those which received its patronage in the past.

One of the busier full fashioned silk hosiery mills, making only women's lines, sells the bulk of its output to jobbers; considerable of it to retailers, and some to consumers, through canvassers and by mail. This mill, operating 50 flat machines, purposes additional installation by summer. A smaller establishment, making women's seamless pure silk and silk in combination with artificial silk is operating every machine full time and selling its production. When goods that jobbers were expected to buy, but did not, accumulate, they are sold to large retailers. The mill employs only spring needle machines. Conditions of

the two mills referred to are typical of those in a number, so that it is apparent there is good business in good staple hosiery, notwithstanding the flood of novelties.

"Will the growing popularity of novelty hosiery affect sales of staple full fashioned and seamless silk?" was asked of manufacturers of both classes. They thought that, on the whole, it might become expedient for some manufacturers of silk lines to curtail, that, by reason of the novelty craze, competition in staples will be keener than it ever was. Innovations also are cutting deeply into the sales of cotton staples, it would appear from trustworthy reports, and one of the strongest numbers is of the pineapple or crossrib stitch for women and misses. It was a big seller last year for the comparatively few manufacturers who essayed that form of construction, and still is running big, with an increasing number of mills. In fact, it is regarded, for the time, a staple number. It has given misses' mercerized and combed ribs somewhat of a wallop.

Conspicuous among the silk novelties is the knee length stocking for women, which probably had its inspiration in the seven-eighth and three-quarter lengths for misses, the forerunner of woman's weakness for the full length stocking rolled. If the stocking is to be worn short, it would seem the knee length might be preferable to the full length rolled. Finished off with two to three bands in colors, it is natty as well as comfortable, and it should cost the wearer less, for there is a saving of say five inches of fabric, and the quantity of silk consumed can be reduced by the elimination of a few needles from full fashioned machines, for procuring a snug fit at the top and supplying a measure of support for the stocking, although this is taken care of in several lines by the carrying of a bit of circular elastic through a casing encircling the leg, flanked by stripes in harmonizing or contrasting shades.

A Central West manufacturer whose showings of women's novelty hosiery approximate the ultimate had an unusual experience with two numbers, sold to only a selected list of large jobbers in a few of the larger cities. The mill received repeat spring orders before shipments had been made against the initial, and in several instances the second orders were for more dozens than the first. It is assumed the jobbers in the selected class had an unexpected response from retailers on first showings of samples. The stocking is in the dollar a pair range. An innovation that looks promising carries the ombre cloth effect. Jobbers who have given it a once over declare it is a winner, and backed their opinion with orders. A Philadelphia mill is being operated 24-hour days in the production of a woman's novelty stocking, the vertical and horizontal stripes of which are broken by small white rectangles on a dark background.

So popular are sheer silk and pattern hosiery that it might seem there could be but a very narrow market for standard silk for women. Yet numbers of manufacturers of the plain service staples appear to be well supplied with business for at least a short run. There seems to have been a tapering of the volume of business going to seamless mills using latch needle machines exclusively. Until the early part of last month production of chiffon silks was being increased and dealer demand continued strong. It is believed the crest was reached when mills were operating overtime or had diverted machinery from standard weights, and that, assuming contracts were for deliveries running into the early summer months, there is in sight a slowing down on output of the very gauzy.

The use of sheer hosiery in periods of low temperatures proved a boon to a manufacturer of seamless silk who was left with a surplus that was not moving. The goods were offered at a price low enough to make them attractive as underhose. Thus, beneath a dollar chiffon there may be worn a stocking of stouter fabric costing the wearer a half dollar and even less. Suitable for understockings are a mill line of seconds offered to jobbers at $2.87½ a dozen, thirds being quoted at $1.75. Of course they are menders, and some would look better off the leg than on. The mill's better than seconds, described as substandard, are quoted at $3.75 to jobbers, and it is stated they have proved quite acceptable in certain quarters as understockings, the market for which, for the current season, is very close to the finish.

Mercerized hosiery has not responded to efforts to stiffen the market. Jobbers called for price, and got it in the way of goods so cheapened that they did not know what to do with them after they got them. Standard lines of women's from certain mills are as readily marketable as at any time in recent years, but the plain 220 needle, with no features other than the old-time talking points—double sole and high splice heel, etc.—are slow moving property. A stocking of the semi-fashioned type, going over the retail counter at 50 cents a pair, still is in good standing in the trade, but its distribution is, necessarily, somewhat restricted.

Mercerized for both men and women is in severe competition, of course, with popular price novelties and artificial silk stockings, and half hose is especially a sufferer from this competition. A really good sock of full mercerized, 220 needles, with double sole and high splice heel, is on the market openly at $1.70 a dozen, a price that may be shaded when business lags or a good prospect drops in. A southern mill is quoting $2.15 for a strictly first-class mercerized sock, a number that sold down to around $1.50 before war sent all prices skyward. It never sold lower than that, it is stated.

Cheapening, it is admitted, has been carried to the very limit in mercerized half hose sold to the average jobber, while mills selling direct to the retail trade adhere to their standards and get higher prices than most jobbers are getting for prime goods. Jobbers went after the direct-to-retailer mill business and, failing to get it on a price parity, persuaded manufacturers to make a cheaper sock. And, it develops, they cannot sell it in quantity alongside of the better stocking at a price representing value and providing a satisfactory margin of profit for the dealers. Cheap goods usually are the first to suffer in a buyers' market such as exists, to some extent.

This was the view taken by a North Carolina manufacturer of misses' coarse gauge ribs who some few weeks ago disposed of his entire stock, after discontinuing their manufacture. His objection was not so much to price as the fact mills quoting 97½ cents a dozen were getting only five cents per dozen rise per size. They could not split even on current yarn cost, on the larger sizes, he contended. But as jobbers were able to buy on that basis it was the best he could get when he unloaded his holdings.

Combed ribs of 300 needles and finer, sold at $1.65, on a 10-cent rise and five-cent fall, are a better proposition than the carded, but the $1.65 price has not always been

obtained. The combed plain staples have held their position better than either carded or mercerized. The latter must be priced so high that it is more difficult to compete with the fancy top seven-eighth lengths, which have had a fine start for another big season. Most mills making them are fairly well supplied with orders, and repeats are offered in right good volume. Several mills which reduced their price, unnecessarily, are reported not making deliveries. There is prospect of a somewhat tight situation in the derby ribs before the end of spring, when duplicate orders come pouring in, as they invariably do toward the tail end of a season.

There is a spotty mill situation as to infants' socks. Some few manufacturers are sold up to April-May, while others are in need of business for keeping their plants running. A Philadelphia mill oversold and has added some machinery, increasing the output by about 10 per cent. This is exceptional, and may be attributed to the mill making a hit with its patterns. The mills most in need of orders, it appears, are making the plainer, popular price lines.

Pending the naming of the new prices for artificial silk, manufacturers of hosiery in which the fiber is the outstanding feature were in a perplexing position. Some accepted business at prevailing prices, on the assumption the producers of artificial silk would make no advances. Others declined business except at open or higher prices. Jobbers were as much upset as manufacturers, and for the time production of artificial silk hosiery involved so much risk that some interests preferred to leave commitments wait until the situation had clarified, and last month, according to mill reports, production was diminished.

At the increases of 10 and 30 cents a pound respectively in prices of B and C grades of artificial silk, manufacturers of hosiery consuming these grades are brought into keener competition with users of A quality, as the quotation on the latter remains unchanged. But some mills cannot get the fiber unless they pay a premium to second hands, and for this reason several mills last month took their lines off sale. The rayon hosiery situation was not improved with the new prices of the fiber, but doubtless will become steadied by April, when the big producing companies will begin shipping against new contracts.

Artificial silk plaited on mercerized continues a right good half hose proposition, and several manufacturers are putting the fiber on carded yarn, one line of socks of this construction being offered to jobbers at $1.85 a dozen. It was believed that with any material increase in the price of the fiber there would be further recourse to cheapening. But this type of sock must be distributed in a very uncertain market. It is a cheap stocking for a cheap trade. It is made to compete with low price mercerized and combed.

One of the better looking lines of half hose on the market is of pure thread silk reinforced with artificial silk. It sells to jobbers at $3 a dozen, and no doubt would be certain of a big sale for summer but for the flood of novelties at a like price and up to a dollar a pair. There appears to be no limitation on the string of novelties for men, and that they will be extensively worn right through the year is foreshadowed in their popularity in wool lines for fall, of which there has been some substantial selling in the primary markets.

A MILL owner says of his Tannate Belt, "I do not believe any load could make it slip. It has paid for itself twice over."

The unusual pull of Tannate is a big thing on your more difficult or more particular drives. For it means increased output and often better quality because of the steady even running of your machines.

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If Barnum could have contemplated the craze for freak half hose he probably would have increased his estimate by 100 per cent or more. It is related by a strong primary market factor that a line of balloon type cotton half hose —sometime referred to as "sloppy," which had been selling regularly at 25 cents, was put up in packages of three pairs each—no two pairs alike—and sold at $2 for the package, as an experiment among collegians, where, the trade says, half hose style originate. Some were sold during the colder days, as the socks, while of cotton, had the feel of wool. A line of wool hose to retail at a dollar a pair is being sold for fall, the striping being similar to that in the 25-cent cotton goods advanced to $2 for three pairs.

Southern mills are vieing with those in the North in the creation of novelty stockings, and the Shoaf-Sink Co., Lexington, N. C., is one that seems to have taken advance ground in the production of a faddish half hose with horizontal and vertical stripes. The stocking is described as reverse plated, and is packed in half dozen cartons of three colors each. There is reported a fair sale of men's cheap heathers, priced around $2.35 to jobbers.

In their contracting for wool hose for next winter many jobbers are reported giving preference to better appearing goods at slightly higher prices. For example, of two numbers of artificial silk-and-wool, one is priced $5.50 and the other $4.75. The latter is equally as good a stocking as the former, but lacks in classy appearance, and the $5.50 number is leading in sales by a comfortable majority.

The hosiery market supplies a subject for very interesting study. It was quiet last month but the outlook was

good, and there seemed little doubt the fondest hopes would be realized unless there was too much of speeding up in anticipation of a spring boom.

Underwear.

There were days in February when trading in underwear seemed almost at a standstill. At times there were indications of some jobber interest. On the whole, the situation was unsatisfactory, except from the fact prices remained firm and the bulk of the business was still ahead. The quiet could not be attributed to price, for leading jobbers admit underwear is priced right by mills and is, seemingly, safe against disturbing reductions, even though there be slight recessions in cotton. It simply was a case of waiting —the retailer until he wakes up, the jobber for the retailer to act, and the manufacturer for the jobber to buy, as the first step in functioning.

A manufacturer who probably has booked more business for fall than most of his competitors estimates that jobbers as a body have not bought 50 per cent of their presumptive requirements. "Some of our customers," he says, "have contracted for more, most of them for less, and some have yet to place their intial orders. I cannot account for the tardiness of the jobbers," he continued, "our goods are priced right for the retailers, and jobbers tell us so, yet they are holding back, as if afraid to buy until they get orders."

Another mill executive who can boast of volume business for the first two delivery periods believes jobbers are looking for a recession such as was offered by mills about July last, after remaining out of the market. But the situation at that time supplied no parallel for that now existing. Then, it was known, there were carryover stocks among jobbers and retailers. This winter jobbers made a cleanup and retailers will, judging from their conservative buying all through the winter, and at that time cotton was around 10 cents higher. As a matter of fact, if underwear were priced on cotton at current exchange quotations it would be higher. It probably could not be marked much lower if cotton declined to 20 cents, something practically no one in the trade looks for.

Almost every jobber of any importance has heavy weight underwear on contract. Some are taking in goods bought at specially low prices for the early delivery period. They doubtless would have been operating more freely last month had retailers been taking in goods for spring. They took in practically none in January, and not much in February. This attitude on their part has left the jobber suspicious that they will accept no deliveries of winter underwear before around September, except in the colder Northwest, where goods are already moving into distribution. In the circumstances, there could not have been much stir in the underwear primary market.

The three southern mills which were the first to come out with prices for the next heavy weight season appear to have booked pretty nearly the expected volume of business. One has sold up of certain numbers for the first delivery period and all have taken some orders for the second. Two mills in Ohio, whose lines are, admittedly, distinctive for detail of finish, and ordinarily command higher prices than run of mine cotton ribs, have booked bumper business for winter and the sales of both for spring are, relatively, larger than for winter. Each sells to jobbers. What applies to novelty hosiery in respect of sales seems applicable also to the not commonplace underwear.

The fact jobbers are placing repeat orders for summer weights of bal briggans and ribbed goods, with spring needle garments in especially good request, is accepted as evidencing a better flow of orders from retailers than one might suppose, judging from jobber complaint. Men's knit underwear for the oncoming season undoubtedly is moving, and manufacturers who for a time were somewhat perturbed are feeling more secure in the outlook for the usual volume of summer business.

There was a revival of interest in women's light weight underwear of artificial silk in combination with cotton following the naming of prices on the fiber for the second quarter of the year. This type of construction for almost all classes of women's underthings is fast growing in favor, and this year, there seems no doubt, manufacturers will have a volume of business well in excess of that of last year. This does not mean that plain cotton vests, drawers and union suits will be shut out, for at least three of the Pennsylvania mills are operating at capacity on orders, mainly from catalog houses and chain stores. These have come to be regarded the better outlet for women's low price cotton underwear.

In underwear as in hosiery, old time staples are slipping, and it is aptly stated by a well known factor that no longer are there standards for women's undergarments. The business of the country store is drifting to the cities and the rural consumer is to a great extent cityfied in her tastes. The automobile brings the ruralite to the metropolis. In men's underwear there is, unmistakably, a growing trend to the cut and sewed, popularized by extensive advertising of athletic nainsooks. All of which lays testimony to the value of advertising and suggests that the manufacturer of the knitted garments has got to get out of the old rut in order to hold his place in the merchandising procession.

Sweaters appear to be drifting from novelties to certain types of standard garments as a safety expedient. Sweaters are not priced adequately, considering the high level attained by wool and worsted yarns, which also are underpriced, on the basis of raw material cost, yet appear too high in the eyes of manufacturers to be safely put into sweaters. The volume business coming through is disappointing to most mills, with business in men's staples leading. Since it is conceded women's garments are to be more nearly standardized it is reasoned that women as a class will use fewer of them. While the novelty craze prevailed the average wardrobe contained more styles of sweaters. It would appear there is in process a sort of evolution in the three major divisions of the knitting industry, in which construction is of greater moment in competition than is price.

Louis Zanelli and Solomon Kaplan were awarded first and second prizes respectively for proficiency in the chemical and dye courses at the Textile High School, New York City, it is announced by Principal William H. Dooley.

These prizes are offered annually by Col. Herman A. Metz, president of H. A. Metz & Co., Inc., as a practical evidence of a belief that the surest way to perpetuate the importance and effectiveness of the dye and chemical industries is to awaken the interest of the younger generation in these branches.